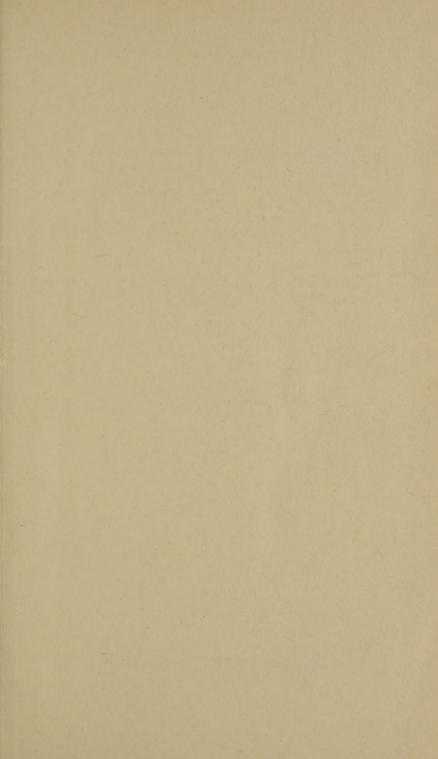Bay 227

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PART FIRST.

Analytical and Critical Reviews.

Art. I.

1. *Statistical Reports on the Sickness, Mortality, and Invaliding among Her Majesty's Troops serving in Ceylon, the Tenasserim Provinces, and the Burmese Empire. Prepared from the Records of the Army Medical Department and War-office Returns. Presented to both Houses of Parliament by command of Her Majesty.*—London, 1841.

2. *Statistical Reports on the Health of the Navy for the years* 1830, 1831, 1832, 1833, 1834, 1835, *and* 1836. *South American, West Indian, and North American, Mediterranean, and Peninsular Commands. Ordered by the House of Commons to be printed,* 1840.

3. *Statistical Reports on the Health of the Navy, for the years* 1830, 1831, 1832, 1833, 1834, 1835, *and* 1836. Part II. (*Cape of Good Hope and West Coast of Africa, and East India Commands, Home, and various forces.*) *Ordered by the House of Commons to be printed,* 1841.

The former Reports of Major Tulloch have received at our hands that full share of extract and comment which we are in the habit of bestowing on important and valuable works; and as the present volume supports to the fullest extent the character of its predecessors, an ample view of its contents shall be laid before our readers. We have associated with it the Naval Reports to which we always intended to revert; and the present we think a very suitable occasion for doing so, for reasons assigned in the following extract from the "Introduction" of Major Tulloch's Report:

"In connexion with these investigations a condensed series of reports on the health of the navy was last year presented to Parliament, which, besides affording a most useful means of comparing the relative health of seamen and soldiers, supplies excellent corroborative evidence of the accuracy of the deductions in this and the previous volumes, as to the remarkable immunity from endemic fevers at some tropical stations, where the alleged causes of it are obviously abundant; and also, in regard to the general prevalence of consumption and other affections of the lungs in the naval and military force employed

in the Mediterranean—points on which, without such corroborative evidence, some doubts might perhaps have been entertained."

We concur with Major Tulloch as to the importance of the testimony derived from the Naval Reports, in corroboration of his own conclusions regarding the causes of disease. But we would remark, moreover, that no inconsiderable portion of the value of each succeeding Military Report depends on the opportunity of comparison on this head between it and its predecessors; for from no quarter can Major Tulloch's deductions derive more important or authentic confirmation than from his own further researches. At the very commencement of his Report we find a topographical and statistical view of Ceylon, having an important bearing on this point; and we shall extract from it those portions which have the most direct reference to a subject as interesting to us as to the gallant author.

The Island of Ceylon lies on the western side of the Bay of Bengal, between 5° 54′ and 9° 50′ north latitude, and 79° 50′ and 82° 10′ east longitude; and measures 270 miles in extreme length, 145 in extreme breadth, and includes an area of about 24,664 square miles. It is bounded by a wide expanse of ocean in every direction except on the north-west, where the gulf of Manar—about twenty miles in width—separates it from the continent of India.

The number of inhabitants is estimated at 1,100,000, or about 44 to the square mile. So limited a population in an island nearly equalling Ireland in extent, shows that the greater part must be uncultivated; in 1831, out of more than 2,000,000 of acres, only 300,000 were under crop, and 76,000 under pasturage.

Ceylon is naturally divided into two extensive tracts of country—the upper and lower; the former occupying nearly the centre of the island, and consisting of a broken mass of highlands, towering to the height of many thousand feet; while the lower is merely a level belt of ground, varying from thirty to forty miles in breadth. Except in the vicinity of the principal villages or lines of communication, this flat belt of land, which stretches in every direction to the sea-coast, is in a great measure covered with forests, and is frequently wet and marshy, owing to the streams from the high grounds overspreading the surface during heavy rains, and evaporation being retarded by the dense foliage, which excludes the solar rays; while universal gloom and stillness indicate the locality as unfavorable to animal life. In some parts, however, the low grounds present a different aspect; and as the sea-coast is approached, indications of life and industry become more frequent, and cultivation is found rapidly advancing under the exertions of an increasing population. Along the banks of many of the streams, particularly at their embouchure, numerous villages are to be met with; and in the districts of Galle and Colombo, which are the most populous, the inhabitants average from 150 to 160 per square mile.

The interior of the island is described as consisting of a succession of isolated hills, for the most part of a conical or oblong shape, but in a a few instances stretching into a table land of considerable extent, rising rapidly over each other from the level belt of land above described, to the height in some cases of above 8000 feet. The valleys of the interior are exceedingly fertile, and, owing to the facility of irrigation, are generally

cultivated with rice; the hills are seldom brought under cultivation, though well adapted for every description of tropical produce. Except on the southern slope of the highlands, where the country is open, forest and underwood clothe the surface with the same dense covering as in the low grounds; and during heavy rains the rivulets rush down with such impetuosity as to inundate the level grounds along their course, and this abundant supply of moisture, aided by the power of a tropical sun, speedily gives birth to such a density of vegetation as to render the uncleared valleys nearly impassable.

Owing to its proximity to the equator, Ceylon may be said to possess a perpetual summer, varied only by the occasional difference of a few degrees of temperature, or by a change from wet to dry weather, or the reverse. These changes are principally effected by the south-west and north-east monsoons, the former of which extends from April or May to October, the latter from November to February or March. The south-west monsoon reaches the island cool, invigorating, and saturated with humidity, after having traversed a vast expanse of ocean. The north-east monsoon arrives at Ceylon under very different circumstances; for the more that wind inclines to the north, the more land it has to pass over before reaching the island. Owing to the modified influence of these winds in some parts compared with others, very considerable difference prevails in the relative degrees of moisture, and in the periods at which most rain falls. The moisture of the south-west monsoon is checked in its progress across the island by the highlands of the interior, and rapidly condensing, pours in torrents on the stations to the south and west; but the same effect is not experienced to the same extent from the north-east monsoon; both because the wind is less saturated with moisture, and because there are no hills in the district to aid its condensation, much of it passes over the coast and falls either on the highlands of the interior, or on the stations to the south-west. Thus, while in Trincomalee there is seldom any rain, except during the north-east monsoon, at Colombo and Galle showers are frequent, not only during the whole continuance of the south-west monsoon, but throughout the year; consequently the districts of the former have generally an arid and parched appearance compared with the latter.

There is no hygrometric measurement of the average dampness of Ceylon; but that it exists in a considerable degree in the lower grounds is indicated by the ready deliquescence of salt and sugar there, and the tendency of metals to corrosion. The fall of rain on the south-west coast averages from 70 to 80 inches, and on the north-east from 50 to 56 inches annually. Dew, however, is rarely deposited in any quantity, owing to the equality of the temperature of the day and night. Ceylon possesses a mean annual temperature of about 80°. It varies at the different stations occupied by our troops, according to their elevation. At Colombo, on the coast, the annual range of the thermometer is from $88\frac{1}{2}°$ to 74°; at Trincomalee, likewise on the coast, from about 91° to 75°; at Kandy, 1676 feet above the level of the sea, from 84° to 60°; at Niuera Elia from about 69° to 41°. Along the coast the daily variations of temperature rarely exceed 10° or 12°; but at Kandy a difference of 20° has sometimes been observed; and at Niuera Elia it has been seen to amount to 37°.

In Ceylon, then, the reputed causes of disease—the moisture, the high temperature, and the jungle—exist in abundance; nor does the medical history of our troops there belie its character. The admissions into hospitals are at the rate of 1678 per 1000 of the mean strength, and the deaths 69·8 per 1000, or, some allowances being made for omissions in the medical returns supplied from those of the War-office, 75 per 1000—a mortality nearly four times as high as in the United Kingdom, and only 6 per 1000 lower than that of the Windward and Leeward command in the West Indies. Of this very considerable mortality we find nearly 24·6 per 1000 arising from fever of different types, of which common continued is of the most frequent occurrence, and remittent the most fatal. Of 20,846 cases of fever admitted into hospital during the period of twenty years—from 1817 to 1836, inclusive—comprised in the Report, there were 10,965 cases of common continued fever, 5238 of intermittent, and 4643 of remittent. Of those admitted with common continued fever, one in 130 died; of those with intermittent, one in 50; and of those with remittent, one in 5⅓.

I. FEVER. The continued fever of Ceylon is a tractable disease, and is not supposed to arise from any malarious influence; but rather from solar heat, intoxication, or other sources of excitement. The intermittents in the general return appear numerous, but when we learn that nearly two thirds of the cases took place in 1818 and 1819, when the troops were employed in very arduous service, and much exposed to the inclemency of the weather, we are led to the same conclusion as Major Tulloch, that " the proportion is very low indeed in an island having so moist a climate, covered with wood, and abounding in all the agencies which are supposed to induce fevers of this type." This view is confirmed when we remark that from 1825 to 1836 inclusive, the number admitted for this disease did not exceed 22 per 1000 of the strength annually, a tenth part of those occurring in the West Indies, with a *similar* climate, and a country better cleared and more under cultivation.

The remittent fever of Ceylon is a singularly deadly disease, as is manifest from it proving fatal to nearly one in five of those attacked, a virulence exceeding that of the yellow fever of the West Indies, which is fatal to one in eight; indeed about one third of the entire mortality among our troops during twenty years of service there has been owing to it. It is subject to epidemic aggravations, which have not been universal but confined to particular localities; and, it would appear, that although, as a general rule, the situations in which these aggravations have occurred have possessed an ample share of inundation and jungle, they have not done so in a very eminent degree, compared with the rest of the island. The most striking of several instances of this epidemic prevalence occurred in the district of Welasse in 1818. This district is described as extending from the eastern slope of the hills, which bound the elevated terrace of the interior to the sea-coast; and as being, from the base of the hills to the sea, low, flat, and subject to frequent inundations during the wet season, in most parts covered with forest and jungle, but in others possessing a considerable extent of rice cultivation. Kottabowa, however, the principal station in the district, and where the sickness prevailed, stands on rising ground overlooking the level tract, and its vicinity was tolerably well cleared and free from jungle. The total force in the district was 254; of these there

perished of the fever, between the 12th of July and the 20th of October,
209; and of the 45 remaining on the 20th of October, the great majority
are understood to have died before the end of the year.   Unfortunately
it was necessary to *march* a division of 192 men belonging to the 86th
regiment through this most pestilential district.   Though they all left
the coast in excellent health, 125 were attacked by remittent fever, and
29 died between the 20th of October and 20th of December of that year;
and at the latter date 30 were still in hospital, of whom several also died.
In no part of the West Indies, nor even on the west coast of Africa, ob-
serves Major Tulloch, has fever ever assumed so severe and fatal a form.
Whether, however, it would be the same in all years in that part of the
country there are no means of determining, as white troops have not
since been stationed there.

In other cases, however, it has been evident that an epidemic similar
to the foregoing has formed a contrast with the ordinary sickness of the
district.   Such an epidemic appeared at 1824 at Kandy, which post we
have already described as situated at an elevation of 1676 feet above the
level of the sea; and as, consequently, enjoying a more moderate tem-
perature than the flat country of the island.   Eighty-two inches of rain
fall, on the average, in the year; and the soil is described as consisting
of siliceous and argillaceous particles, the detritus of the neighbouring
mountains, mixed with small portions of calcareous matter.   We find
that the highest rate of annual mortality of white troops prior and subse-
quent to 1824 was 80 per 1000, the lowest was 12, and the average of
16 years, exclusive of the epidemic year, was 43 and a fraction, whereas
in 1824 it amounted to the ratio of 333 per 1000, in other words to one
third of the entire force.   This prodigious mortality arose mainly from the
prevalence and fatality of remittent, of which there perished at Kandy
and Kornegalle, a place thirty miles to the north-west of Kandy, whence
a small garrison was furnished to it, 113 of a total force amounting to
about 350.   During the epidemic there was likewise an increase of inter-
mittents.

" A slight increase of temperature," remarks Major Tulloch, " and a longer
continuance of dry weather than usual, were the only circumstances which pre-
ceded or marked the continuance of this epidemic; but its subsequent reap-
pearance in 1824 and July 1825 was not marked by any such indications, and,
since then, every variety of season, hot and cold, wet and dry, equable and
changeable, has passed over without inducing a greater extent of febrile disease
than would be likely to occur among an equal number of troops in the most
healthy of our colonies." (Tulloch's Report, p. 30.)

Of all inscrutable matters connected with etiology, these epidemic ag-
gravations of endemics are the most inscrutable.   Their very range is
matter of dispute; as, for instance, it is still disputed whether the yellow
fever of America and the Spanish coast be or be not a mere aggravation
of the remittent ordinarily existing there.   In the case of Ceylon there is
no dispute; we find no intimation of any suspicion of a new or unwonted
disease introduced *ab extra*, as has often been supposed to be the case
with yellow fever; the disease prevailing was too manifestly only a
more abundant crop of the ordinary fruit of the climate.   But when
we endeavour to search the causes of such unwonted prevalence, how
involved in darkness do we find them!   A common supposition is that

diseases not ordinarily contagious, as remittent fever for example, become invested with this property. But this is merely carrying the difficulty a step further back, for it meets us in the question, " whence this contagious quality?" which we are unable to answer.

We quit these statements of Major Tulloch regarding fever in Ceylon, to place in contrast with them details from a region which, though situated in an opposite hemisphere, abounds equally with Ceylon in the high temperature, the marsh, and the moisture, and what are considered " the appliances and means" of pestilence, without engendering it—South America. After describing the great extent of coast and cruising ground in the South American command, Dr. Wilson, in the Naval Report, proceeds to say :

" The places principally frequented are Rio de Janeiro, Buenos Ayres, Bahia, Pernambuco, and Para, Valparaiso, Callao, Coquimbo, Panama, and San Blas. In some of them art has been busy and effective; large towns have been built, and the ground has been cleared and cultivated in the neighbourhood of the towns, and on the margins of the bays and harbours ; in others, beyond rearing houses and stores, things remain very nearly in their natural condition. Hence extensive marshes are in close contact with many of them; while in others, but more from natural formation than the labours of man, dry land, little productive of vegetable matter, abounds. The places named are, with three exceptions, situated within the tropics, some near their external limits, some close to the equator, and others at different intermediate points ; yet with all such difference in position, soil, products of soil, and climatorial heat, the inhabitants of the shores of this vast continent, whether permanent or occasional, enjoy a high and singularly uniform degree of health.

" For the health enjoyed it is difficult, impossible, according to commonly received opinions, to account. Epidemic diseases are scarcely known; with wide-spreading and destructive force they are totally unknown. The fever which frequently makes such havoc in the West Indies never makes its appearance here. To such fevers as those which are so fatal in Asia and Africa, in North America, and even in the Mediterranean, the people of this continent are not subject. They are not free from febrile disease, but they suffer little from it, and from severe sweeping epidemics of all kinds they are exempt. What is the cause of such immunity? Why is it that in a land-locked harbour in this part of the world, under a powerful sun, surrounded by marshes and rank vegetation, ships lie for months or years without the occurrence of a single case of concentrated fever ; while in other places, in Africa, in Asia, in North America, and more especially in the West Indian islands, things, to superficial observation, which appear to be the same are productive of so much disease and death?" (Naval Report, No. i. pp. 4-5.)

The copious returns in the Naval Report justify to the fullest extent these general statements of Dr. Wilson. In the year 1832, for example, the ratio of mortality was 6·2 per 1000 of mean strength, every instance of death, whether from disease or accident, being comprised. The Warspite, with an average complement of 600 men, lay the whole year in Rio Janeiro harbour, and did not lose a man, and had only seven cases of fever, viz., two of intermittent, four of gastric-remittent, and one catarrhal.

We now turn, for the sake of comparison, or rather contrast, to a region the insalubrity of a portion of which to the European constitution has long been well known to the British, viz. the West Indies and North America. From the Naval Reports we learn that in the squadron there employed the sickness had been moderate from 1831 to 1834, inclusive,

but still with a progressive increase in the class of diseases—the febrile—on which mortality in that region is mainly dependent; each succeeding year being more unhealthy than its predecessor. We shall state the rate of progression in this class. In 1831 the mortality from fever was in the ratio of 4·8 per 1000 of the mean strength; in 1832 it was 5 per 1000; in 1833, 6·8 per 1000; and in 1834, 11·8 per 1000. When we reach 1835, however, there is a very sudden advance indeed in the general mortality, and especially in that from fever. In 1831 the ratio was 11·7 per 1000 of the mean strength; in 1832, 11·4 per 1000; in 1833, 16·3 per 1000; and in 1834, 19·8 per 1000; whilst in 1835, it was 37·5 per 1000. In the febrile class, in 1835 the total mortality was 98, being in the ratio of 30·6 per 1000 of the mean strength employed, and 1009 being the number attacked, is that of 97·1 per 1000 of those who sickened.

The succeeding year, 1836, presents a marked contrast to its predecessor. The total deaths from febrile diseases during it were 13, being in the ratio of 3·7 per 1000 of the mean strength; whilst the total deaths from all diseases were 32, being 9·2 per 1000 of the mean, or in the former case, one seventh of the mortality in 1835, in the latter, one fourth.

Discrepancies so striking as these between two consecutive years, and the gradual growth during five years of the endemic till, in 1835, it attained its maximum epidemic prevalence, to sink in 1836 into a dormant state to recruit its energies for a fresh career, are facts which cannot fail to set the mind on reflecting and speculating as to their causes. Without at all thinking it sufficient to account for the great increase of fever, we are of opinion that a circumstance not noticed by Dr. Wilson,—viz. the great increase of the naval force in the West Indies during these latter years, owing to the approaching emancipation of the slaves,—had considerable effect in swelling the list of the numbers attacked. Dr. Wilson's remarks are sensible and moderate. They may be charged with want of definiteness and clearness; but who can be clear on a subject consisting only of an assemblage of facts unreferred as yet to any general law—that which we had fondly framed for their explanation having proved fallacious?

"The mortality," says Dr. Wilson, "has been progressively increasing through a period of five years in the united squadron; the rate of increase being proportionate to, and dependent on increase in the force of febrile disease. Progressive increase of this sort in West Indian fever and other endemic diseases, during a number of consecutive years, tending to, and terminating in a general distribution of its agency, is often observed. It may be represented, in a general way, as taking the following course: After the lapse of a year or two, in which it can scarcely be traced, it occurs rarely or separately during another year or two. During another similar period it will arise more frequently, but still with considerable intervals of time and space; then, connected perhaps with a particular state of the weather, it bursts forth simultaneously at various points of the island and its harbours; the endemic becomes epidemic, attacking at once ship, regiments, and citizens, and carrying off great numbers. After such a course, though it may linger a little with greatly reduced force in some places, a period, longer or shorter, of exemption ensues. The cause of the disease seems exhausted for a time, the stock accumulated—so to speak—worn out, and a certain period is necessary to its reproduction.

"What is the meaning of this progress? What is the reason why an epidemic, having been extinguished, reappears, first in solitary and detached in-

stances, then more frequently and in closer connexion, gathering strength as it proceeds, and finally explodes with the renewed power of a sweeping epidemic, again to be extinguished and again to be renewed? It would appear that the cause of the disease is associated intimately and necessarily with a peculiar local influence—a morbific atmosphere, emanating from, or not far from, the place where the disease is excited ; that the local morbific atmosphere is occasioned by certain inappreciable actions carried on with more or less intensity at or near the surface of the earth ; that these actions proceed at different rates at different times, and under modifying circumstances, their products being also different, not in kind, but in degree ; and that the disease has close, continual relation to these actions and their morbific results, being rare at their commencement, more frequent as they proceed, and rife when they are complete. It is probable that degrees of heat and moisture, and other anterior agencies, as well as local circumstances, acting on individuals, influence the cause or the subject of the disease, or both, and that they have the power of precipitating or retarding, of lessening or augmenting the force of the essential cause." (Naval Report, No. i., pp. 108-9.)

The details of sickness in the Mediterranean and Peninsular squadron present, so far as fever is concerned, a very different picture from the foregoing. The proportion of cases and deaths, though not uniform, shows neither the steady movement from year to year observed during one period in the West Indies, nor the sudden exaltation of the disease into an epidemic which distinguished another. The loss was small, being under 2 per 1000 annually of those employed ; greater, certainly, than in that very remarkable country, South America, where the average deaths amounted only to 1·3 per 1000, but small and insignificant when compared with that in the West Indies.

We shall continue the subject of fever through the Cape of Good Hope and the west coast of Africa commands. In the case of the navy, where ships are continually moving from one point to another, it is impossible to appropriate to each its due share of the causes of disease and death ; the naval returns presenting, in this respect, a contrast with the precision which the Military Reports derive from stationary garrisons. The present Report, then, comprising the whole of an enormously extensive cruising ground, must be expected to differ widely in its results from the different portions of the Military Report which we have already passed in review, (Brit and For. Med. Rev., Vol. XI., p. 365,) representing neither the extreme salubrity of the Cape, nor the deadliness of that most pestilential of regions, the tropical part of the west coast of Africa. Of all forms of essential fever there were, in the seven years comprised in the Reports, 1587 cases, being in the ratio of 149·8 per 1000, annually of the force ; of these 57 were invalided, and 135 were fatal ; or in the ratio of 5·4 per 1000 of the former, and 12·7 of the latter. The destruction of life from all causes amounted, during the seven years, to 25 per 1000, on the annual average of the force. Notwithstanding that the west coast of Africa occupied little less than one half of the force, yet is the general mortality, and especially that from fever, lower than we should have expected. The lowness of the rate receives from Dr. Wilson the additional explanation, that fever, in a concentrated form, was not very prevalent during the period comprised in the Report : it happened that immunity to a considerable extent, compared with preceding and following years, was enjoyed during the period.

The Naval Report brings us now again to the point whence we started to trace the progress of fever round the world—the East Indian command. This extensive command embraces 70 degrees of latitude, and 100 of longitude, extending, in one direction, from the Tropic of Cancer to the 45th degree of south latitude; and in another, from the 50th to the 150th of east longitude. The northern limit is the isthmus of Suez, the southern the island of Tasmania. Notwithstanding the remote boundaries of the command, the operations of the squadron are principally directed to the shores of the bay of Bengal, of the coast of Coromandel, and of the *island of Ceylon.* From this statement it is manifest that the service of the squadron is, in a large proportion, intertropical, a great portion of it close to the equator. Yet, though the heat is necessarily high, and though the shores frequented abound with the reputed causes of violent disease, we find, on surveying these returns, the general mortality and that from fever much less than might be apprehended. The mortality from all causes was 17·3 per 1000, per annum, and that from fever 3 per 1000 per annum, of the force employed. There were 2302 cases of fever admitted during the seven years, of which but 39 were fatal from a total force of all classes, men and officers, of 12,948. Whereas, by reverting to Major Tulloch's Ceylon Report, we find that there the admissions from fever, out of a total force of 42,978, amounted to 20,846, or in the annual ratio of 485 per 1000 of mean strength, and the deaths from fever were 1056, being in the annual ratio of 24·6 per 1000 of mean strength. The total admissions from all diseases during the period were 72,100, being in the annual ratio of 1678 of mean strength; whilst the total deaths were 3000, or in the annual ratio of 69·8 per 1000. It thus appears that the total mortality was more than four times greater among soldiers than sailors, and the mortality from fever eight times greater; though, as we have already stated, the main cruising-ground of the squadron was intertropical, and a portion of it around the island where the sickness of the troops was comparatively so great. This appears the more remarkable when we consider that Trincomalee, where the greater part of the naval force is stationed, has a much more insalubrious character than any of the British settlements in the East, at least, so far as regards troops on shore; but it has always been remarked that the sickness which is so often prevalent among them very rarely extends to the shipping, though only a few hundred yards from the shore, with which the intercourse of the seamen is at all times free and unrestrained. We should not have expected that the difference of effect from occasionally touching on shore, and permanent residence there would have been so very great as it is thus shown to be. At all events, these comparative facts serve to settle the question, if there be any question regarding it, of the terrestrial origin of intertropical fevers.

To complete the sketch of the prevalence of fever in the navy we must pursue it through the branch of this service, described in the Reports as " the home and various force." By the " home force" is meant that employed in flag and other harbour duties; cruisers, employed in protecting the revenue, and by surveying vessels. There are three commands, —Portsmouth, Plymouth, and Sheerness. The force employed " variously," consists, if we understand right, of ships sent on special missions, such as from Spithead to Malta, the Cape of Good Hope, Bahia,

and back again, and of ships fitting out. In the former case they are
under circumstances highly conducive to health; in the latter, the crews
having generally been collected recently, and from a state of indigence
and profligacy, and, from a dread of their deserting, being at first ill
supplied with body and bed clothes, one would naturally consider their
circumstances as little favorable to health. The result in these forces so
variously circumstanced, so far as fever is concerned, is thus stated by
Dr. Wilson: The average proportion attacked with fever in the ships on
the "home" stations, was 51·2 per 1000, while the deaths was 1 in 1188
of the mean number employed annually. In the "various" force, the
ratio of attacks was little higher; being 60 per 1000; but that of deaths
was nearly double, being 1 in 625 of the number employed annually.
The following is Dr. Wilson's scale of severity of fever in the different
regions of the world, as shown by the Naval Reports: first, the "home"
force, in which the ratio of mortality was ·8; second, the South American,
in which it was 1·3; third, the "various," in which it was 1·6; fourth,
the Mediterranean, in which it was 1·8; fifth, the East Indian, in which
it was 3; sixth, the West Indian and North American, in which it was
11·2; seventh, the African, in which it was 12·7 per 1000 annually of
those employed.

In a general summary, written with much modesty and good sense, of
the state of health of the entire navy, during the seven years compre-
hended in the Reports, we are informed that fever was the most fatal
form of disease, more than a fourth part of all the mortality, including
that from external causes, resulting from it; yet it was in the proportion
only of 3·7 per 1000 annually of strength, the total number of deaths
being 593, and the aggregate number employed 157,770, in the seven
years. Dr. Wilson questions whether this statement of the really very
moderate mortality, from essential or idiopathic fever is not beyond the
reality; whether there may not be some confounding of symptomatic
with primary or essential fever. From a careful perusal of these Reports
we suspect Dr. Wilson's opinions on fever to be of a somewhat specula-
tive nature; and we should deem it only right and prudent to consider
the evidence of the medical officers immediately in charge of the sick as
decisive of the nature of the disease they were treating. Indeed, to
throw a doubt upon it, is to depreciate the whole Reports; for it is im-
possible to make the requisite correction for the supposed error. And,
moreover, acquiescence in the conclusions as to the nature of the dis-
ease, come to by those in immediate attendance on the sick, if in any
case right, is particularly so in the present; as we are convinced that a
more intelligent or better-informed class of practitioners, whether in
public or private life, is nowhere to be found than the medical officers of
the navy.

Though not connected exclusively with fever, we find the progressive
improvement of the health of the navy, so honorable to the discipline
and interior economy, and, it may be too, to the skill of the medical
officers of this right arm of England, that we take this opportunity of
noticing Dr. Wilson's valuable information regarding it. For the period
comprised in the Reports, the total deaths from disease in our navy, dif-
fused as it is throughout every region of the globe, amounted to 11·8 per
thousand of the force annually; and the total from all causes, disease

and external injuries of every description, including deaths from drown-
ing, the upsetting of boats, &c., to 13·8 per 1000; in other terms, one
in 85 died annually from disease, and one in 72½ from all causes.   To
increase our exultation from this gratifying view, we learn that 30 years
ago the mortality amounted to 31, and 60 years ago to 125 per 1000
annually of the force employed.

Sir Gilbert Blane, in a work published in 1822, stated that the propor-
tion of deaths in the navy should not be more than 1 in 80 annually of
the employed, supposing that the agents affecting life were not more
detrimental there than among the civil population at corresponding ages.
This estimate was formed on the erroneous supposition that the range of
ages in the navy was from 20 to 40 years; it is shown in the Reports to
be from 15 to 50, and yet Sir Gilbert's *desideratum* is more than realized
within 20 years.   What might not the result have been had his estimate
of ages been correct !

The causes of these wonderful improvements are briefly stated by
Dr. Wilson in the following terms :

"They consist in an almost entire change in the constitution of the service,
especially in the following important particulars : abundance of nutritious food,
and of wholesome palatable water; personal and general cleanliness, and com-
fortable clothing ; ventilation, reduced allowance of spirits,* and afternoon meal
of tea ; small monthly payment of money, partly in addition to wages, since the
year 1825 ; regulations and restrictions respecting punishments ; provision for
mental improvement and recreation ; better-built ships, with greater capacity
between decks ; and, it may be added, without reflecting generally on the spirit
and practice of former times, at least in so far as the executive was concerned,
more judicious and humane treatment generally of seamen." (Report, Part ii,
pp. 214-15.)

Two other not unimportant items in this most gratifying category of
improvements, may with great propriety be here mentioned by us,
although the official position in which Dr. Wilson stood, his modesty,
and the public nature of his report, prevented him from noticing them—
we mean, the very superior administration of the medical department of
the navy by its present chief, Sir William Burnett,† and the greatly-
increased knowledge and skill of the medical officers in charge of ships.

II. DISEASES OF THE LUNGS,—PHTHISIS.   We shall now proceed to
trace affections of the lungs in general, and consumption, particularly,
through the extensive and diversified regions comprehended in the
Reports.

In Ceylon, the numbers among the troops attacked with all diseases
of the lungs were, on the average, 70 per 1000 annually, while the
deaths were 4·1 per thousand of the mean strength of the troops.   But
the deaths from consumption alone amounted to 2·7 for 1000, leaving
but 1·4 per thousand of mortality from inflammation of the lungs, acute
and chronic catarrh, and asthma.   The numbers attacked, too, with
consumption, it should be remarked, amounted to 4·7 per 1000, being,
in this singularly-equable climate, not one half lower than in the incle-

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* We think this still much too large.
† Among the many improvements introduced by Sir W. Burnett into the medical
department of the navy, we must particularly notice that of the " Sick Mess," (a greatly
improved scale of diet for the sick,) for which the service is entirely indebted to him.

ment region of Canada, and in the inconstant climate of Great Britain, where the numbers attacked are 6·5 per 1000 annually. It should be observed, moreover, that all the cases of catarrh which terminated fatally in Ceylon (20 in number, or about 5 per 1000 of the mean strength) exhibited marks of tubercular disease, though not included under the head of consumption.

In the Tenasserim provinces, the total report of diseases of the lungs is in strict accordance with that from Ceylon as to the number attacked; but in strong contrast with it as to the proportion of consumptive cases, and consequently as to the total mortality. These provinces, formerly part of the Burmese empire, were ceded to the East India Company in 1826. They are situated on the eastern shores of the Bay of Bengal, and may be said to extend from lat. 10° to lat. 17° N., and from long. 97½° to long. 99° E., forming a narrow strip of territory on the continent of India, about 420 miles in length, and from 50 to 70 in breadth. The number attacked in this district, with diseases of the lungs, was the same as in Ceylon, 70 per 1000 of the strength annually. But the deaths, so far from being in the same ratio as in that colony, amounted to but 2 per 1000 annually; whereas in Ceylon they were 4·1 per 1000. This difference arises chiefly from the rarity of consumption in these provinces, but 4 cases having occurred during the period (10 years) of their occupation by our troops, or 1 to 1704 of the mean strength; of these four cases 3 were fatal. Hemoptysis observed nearly the same relative proportion as consumption in Ceylon and the Tenesserim provinces. The two diseases conjointly were in the latter situation in the proportion of 1 to 8 compared with Ceylon, and as 1 to 10 in comparison with the prevalence in Great Britain, or the Mediterranean. Major Tulloch acknowledges that the period of observation was too short, and the number of troops too small to warrant the conclusion that every year the proportion would be equally low; but he adds, that " this comparative exemption from consumption and hemoptysis extends, as will hereafter be shown, to most, if not to all, the stations throughout India, and constitutes a new feature in the history of these diseases, which will be more fully developed in a future Report." (Tulloch, Tenasserim Report, p. 9.)

Major Tulloch has a valuable report on the sickness and mortality of the troops employed in the Burmese war. The period, however, of the war was too brief, and the circumstances in which the troops were placed too peculiar to render it supposable that a fair inference could be deduced from our experience in the territory as to the influence of the climate on the European constitution. We shall therefore leave, as we did when fever was examined, this Report untouched so far as affections of the lungs are concerned, excepting that we concur in the opinion expressed by Major Tulloch, that the deaths from consumption having been but 2½ per 1000, this country in all probability partakes of the comparative immunity from this disease enjoyed by the Tenesserim provinces, and the whole of India.

From what has been already stated of the extreme salubrity of South America, a moderate return under the head of consumption might be expected from this quarter; but our expectations in this direction are more than fulfilled by the Naval Report. Of a strength consisting of 17,254, there were treated 55 cases of consumption, of which there were 25 fatal;

the annual rate of mortality from the disease was, therefore, 15 per 1000 of the employed.   From the circumstance that 30 out of the 55 were cured, Dr. Wilson deduced the very reasonable conclusion, that all the cases classed under the head of consumption, had not really belonged to the disease, a proportion having simulated it only : of 488 cases of inflammation of the lungs and their membranes, six only terminated fatally ; and of 47 cases of hemoptysis, 4 terminated fatally ; so that from pneumonia, pleuritis, hemoptysis, and consumption, the total mortality was but 35, or little more than 2 per 1000 ; yet were affections of the lungs the most fatal diseases in this singularly healthy region.

In the West Indian and North American squadron, there were 519 cases of inflammation of the lungs and their membranes, of which 26 were invalided, and 22 fatal, the ratio of attacks being 22, of invalided ·11, and of dead ·9 per 1000 of mean force.   Of consumptive cases 114 were treated, of which 44 were fatal, the attacks having been 4·8 per 1000, and the deaths 1·9.   There is supposed to have been an error in the designation of the disease in some of these cases, 70 treated for consumption having recovered.   We think, as in the case of South America, there is ample ground for the supposition.

We are strongly impressed with the smallness of the mortality of the navy, compared with the army ; but by far the most striking feature in the case is the discrepancy in the deaths from consumption in all climates, between these two branches of the public service.   In the navy we see that in the West Indies and North America the mortality from consumption is at the rate of 1·9 per 1000.   Now when we turn to the prevalence of consumption and the mortality from it among soldiers in the same region, we find such returns as the following : In the Windward and Leeward command 12 per 1000 are attacked annually with consumption ; in Barbadoes 15·8 per 1000 die of it ; in Jamaica, where the disease is less frequent and less fatal than in other parts of the West Indies, the mortality from it is 7·5 per 1000.   When we examine the returns from the more northern portions of the same command we find that in Nova Scotia and New Brunswick the deaths from diseases of the lungs among the troops are 7·1 per 1000 annually ; in Canada the deaths from the same cause are 6·7 per 1000 ; and in Bermuda there are attacked with consumption annually 8·8 per 1000.*

When we travel homeward for a comparison we find soldiers dying of diseases of the lungs in an infinitely higher ratio than sailors in the West Indies and North America.   Of the dragoon-guards and dragoons there die annually in this country from diseases of the lungs 7·7 per 1000 ; of the household cavalry, 8·1 ; of the soldiers of the West Indian depôts, 9·6 ; of the foot-guards, 14·1.   When we look at the mortality from diseases of the lungs among our troops stationed in climates conspicuous for their exemption from such diseases, still do we find them more prevalent than among sailors afloat on the coasts of countries a portion of which—the West Indies—Major Tulloch has shown to be singularly favorable to the development of consumption, and in another part of

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* Tulloch's Statistical Reports on Sickness, &c. in the West Indies, ditto in United Kingdom, Mediterranean, and British America ; and Br. and For. Med. Rev., vol. VIII. p. 220 et seq.

which—Canada—the disease has been proved by the same high autho-
rity to be nearly as prevalent as in the United Kingdom. To select
instances : In St. Helena the deaths from diseases of the lungs are 3·4,
and at the Cape of Good Hope 3·9 per 1000 annually among the
troops ; whereas, among sailors in the West Indian and North American
command, the deaths from consumption amount, as we have already
shown, to but 1·9 per 1000 ; and those from all diseases of the lungs to
less than 3·2 per 1000.

In whatsoever direction we try the comparison, we invariably find
diseases of the lungs, and especially consumption, much less frequent
and fatal among sailors than among soldiers. On this subject several
reflections naturally suggest themselves. In the first place, how is the
difference to be accounted for ? Is it merely that the sailor is withdrawn
from an atmosphere, it may be, close and confined, or abounding with
terrestrial impregnations, or the smoke and corruption of the haunts of
man into one of comparative purity and great freedom of ventilation ; or
is there some special preservative or even curative virtue in sea-air, de-
rived, possibly, from its impregnation with chlorine, iodine, bromine,
&c.? We send the phthisically disposed, or those already affected with
phthisis, to climates in which consumption is quite as frequent as in
England, in some cases even more so, yet are they benefited by it.
May not the benefit arise from the voyage ? and should we not better
consult the interests of our patients by advising a course of voyages,
than a residence in Malta, Madeira, or any other given point ? It will
be known to our literary readers that this very remedy was recommended
many years ago by Dr. Gilchrist, in his treatise " On the Use of Sea
Voyages in Medicine, Lond. 1756," and many cases given of its appa-
rent efficacy. The same practice was earnestly advocated subsequently,
in 1782, by Dr. Thomas Reid, in his " Essay on the Nature and Cure
of Phthisis Pulmonalis." Both these authors attributed a principal share
of the efficacy of the practice to sea-sickness, although Dr. Gilchrist, in
particular, regards the saline atmosphere of the ocean-climate as also
very beneficial. If we choose to go still higher for authorities, we find
Aëtius lauding the excitement and inconveniences of a sea voyage as
curative of obstinate chronic affections; and Celsus advocates the measure
very strenuously, in the very disease now under consideration : " Opus
est," he says, " si vires patiuntur, *longâ navigatione*, cœli mutatione, sic
ut densius quam id est, ex quo discedit æger, petatur : ideoque aptissimé
Alexandriam ex Italiâ itur." Now we are not hazarding too much when
we conjecture that no steamer plied from Ostia to Alexandria in the days
of Celsus, and that the consequent length of the voyage endowed Alex-
andria with much of its curative character. Indeed, that sailing is the
main remedy of Celsus is indicated not merely by the phrase, " longâ
navigatione," in the sentence quoted, but by his saying shortly after-
wards, " Si id imbecillitas non sinit, *nave* tamen non longe, vectari com-
modissimum est." (De Re Medicâ, lib. iii., cap. 22.)

The opinions of Dr. Wilson accord with those of the high authorities
we have quoted, and with our own, regarding the sanatory influence of
sailing on the consumptively disposed and even the consumptive, as
will be seen in his remarks made in a summary of the state of health of

the navy in all regions, given in the Report of the " Home and Various Force." He in a subsequent passage, however, qualifies his opinion very considerably, and on grounds special to the service with which he is connected. Had he extended his views into a comparison between his own and the sister service or civil life, we think his original opinion would have received less qualification. His opinion is thus expressed:

" These Reports establish the important fact that sea life has sanatory influence on non-inflammatory affections of the lungs, at least on the most destructive one of them—the phthisical. The influence is chiefly preventive, but would appear to be also, in no small degree, curative. The preventive power shown by the comparatively low proportion of attacks, the curative by the large proportion of the attacked which appear by the returns to have been cured. The existence of a general sanatory influence is deduced, not only from the comparatively low proportion dying of the employed throughout the service, but also from the inconsiderable difference in the proportion dying in different commands, leading to the conclusion, that the diffused beneficial agency countervails the varying prejudicial power of parts and places resorted to. Whether there may be anything salutary in the victualling, apart from its nutritive effects is uncertain: it is certain there is nothing in their duties which, inasmuch as they conduce strongly to inflammatory disease of the pulmonary tissues, tend to excite, not prevent consumption." (Report of the Home and Various Force, pp. 207.)*

On this last point—the tendency of inflammatory disease of the pulmonic tissues to induce consumption—M. Louis and others might enter into controversy with our author. We, however do not purpose doing so, feeling more disposed to question the fact, whether the sailor's duties conduce so strongly to inflammatory disease of the lungs as Dr. Wilson, from this sentence, would seem to imagine. Certainly, looking at Dr.

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* So favorable to the view of the great therapeutic influence of sea voyages in consumptive diseases are the results brought out in these admirable reports of Major Tulloch and Dr. Wilson, that it would seem no idle or foolish proposal to have a ship fitted out for the express purpose of taking consumptive invalids to sea and keeping them there for months or even years. It would be an easy matter to prepare and fit up in the most comfortable manner vessels for such a service; and, alas, it would be too easy to people many such from the crowds of victims of this fearful malady constantly found in that class of society whose members could *afford* to avail themselves of their advantages. We can imagine no better " Residence for the Consumptive," and no superior medical advantages than would be afforded by such a " Medical Yacht," commanded by an experienced naval captain, with Dr. Wilson or some other well-informed member of the medical staff of the navy as "viceroy over him," directing the course and progress of the ship, according to hygiènic and therapeutic principles. The Mediterranean sea, the better parts of the Atlantic and even of the Pacific ocean might thus be traversed—the inhabitants of the sea-city, like Ariel, still continuing " to fly after summer merrily."

Like benefits might be obtained, or, to speak more modestly, a similar experiment might be tried, on a smaller scale, and at a more moderate expense, by taking advantage of the innumerable ships which, as passage-vessels, or for purposes of commerce and colonization, leave our shores at all times and seasons, and for all parts of the world. An uninterrupted series of voyages might thus be taken in the steam packets to Malta or the West Indies and back; or in sailing vessels to the Brazils, India, China, Australia, the Sandwich Islands, Peru, or across the Pacific, returning by China. In this manner a residence at sea, of such length as might be desired, and almost such a climate as was thought most proper, could be obtained; and amid the multitude of ships it would not be difficult to select a good climate as a *land-residence* during the period of the vessel's detention at any port until her return-voyage. For instance, what would seem better than a long voyage to the Brazils, to Peru, to Australia, with a residence of a month or two on the shores or cool hills of these most salubrious countries, while the ship was preparing for her home-voyage?

Wilson's own returns of the fatality of inflammation of the lungs and
their membranes in various commands, we are led to feel a doubt on the
subject.   From such diseases the " Home" and " Various" suffered more
than any other division of the force, and exactly in the same proportion,
the rate of mortality being 1·5 per 1000, annually, in each.   The next
highest is the Mediterranean, which is 1 ; the next is the West Indian
and North American, which is ·9 ; the next the African, which is ·8 ;
the next the South American, which is ·4 ; the lowest the East Indian,
which is ·3 per 1000 of the employed.

A circumstance bearing on this point, and very interesting on many
other accounts, is the remarkable fact that, while the proportion of cases
of *consumption* is so low, that of *catarrh* is so high in the navy, being
twice as high as in the army.   The difference may probably be explained
by greater exposure of the seamen to the inclemencies of the weather,
especially during the night.

III. DISEASES OF THE LIVER.   Passing from the subject of pulmonic
to that of hepatic disease, Major Tulloch informs us that in Ceylon the
admissions were in the ratio of 55 per 1000 annually; and the deaths
in that of 4·9 per 1000, being very much higher indeed than in any sta-
tion in the Western Hemisphere, Grenada in the West Indies alone
excepted, where it amounts to 4·5 per 1000, only a small fraction less
than in Ceylon.   In other tropical climates in the Western Hemisphere,
we find such returns of mortality from liver-disease in the army as the fol-
lowing: in the Windward and Leeward command (West Indies) 1·8 per
1000; in Jamaica, ·1 ; in Trinidad, 1·1 ; and, to turn to a temperate cli-
mate, 1 to 10,000 in the foot-guards at home.*   In the navy, the returns
from the East Indies is 1·5 per 1000—very low indeed in comparison of
the army at Ceylon ; the " Home," ·5 ; the South American and African,
·4 each; the " Various," ·3 ; and the Mediterranean and West Indian,
united with the North American, ·2 per 1000 annually.

IV. BOWEL COMPLAINTS.   Before closing this article we shall give an
abstract of the relative mortality in the army and navy, (so far as these
Reports enable us to give it,) from a class of diseases, to which a great
proportion of the deaths in the former force is always attributable, espe-
cially in tropical climates, those of the stomach and bowels.   In Ceylon
the deaths from these diseases amounted to 24·2 per 1000 , of which
mortality 23 per 1000 was owing to dysentery, a very high proportion,
certainly, and exceeding that in the army, in the Windward and Leeward
command (West Indies), where the deaths from the same disease are
15 per 1000.   In respect of the prevalence of the disease, however, these
stations in opposite hemispheres are nearly on equality, the difference in
mortality arising from the greater severity of dysentery in Ceylon.   In
the navy the returns are as follows : in the South American squadron,
from inflammatory affections of the bowels and dysentery, 1·6, and the
West Indian and North American, 7 per 1000 annually.   What a con-
trast does this last item present to the mortality from such diseases among
soldiers in the West Indies, where, in the Windward and Leeward com-
mand, 20·7 per 1000 die annually of such complaints !   In the Cape of
Good Hope and west coast of Africa squadron, the deaths from dysen-

* Tulloch's West Indian Report, and Br. and For. Med. Rev., vol. IX. p. 64.

tery alone were 3·4 per 1000, whilst those from original inflammation of the stomach and bowels were very insignificant; the ratio of deaths being 1 in 2000 of the force.   In the East Indian command the deaths from dysentery were 4·2 per 1000; those from cholera 2·4 ; and the collective deaths, from acute diseases of the alimentary canal constituted nearly one half of the total mortality from disease during seven years. But it should be remarked that this total mortality amounted only to 17·3 per 1000, or little more than two thirds of the deaths among soldiers from one disease, dysentery, in Ceylon, situated in the same hemisphere, and the same climate.   What a view do these facts present to us of the relative salubrity of the pursuits of the soldier and the sailor !   Is the occupation of the sailor especially salubrious, or must we conclude with Major Tulloch, that the military profession operates prejudicially to the health of those employed in it ?

Throughout our investigations into the four great classes of diseases, whence the main mortality of our fleets and armies arises, Fevers, Pulmonary affections, Liver disease, and Inflammatory disorders of the Bowels ; we have shown that an advantage exists in the former service infinitely greater than any preconceived opinion would have led to the belief in ; and one which, as it appears to us, it is impossible to explain on the mere supposition that the sea service is especially salubrious. We are driven to the conclusion that there must be, besides, some peculiar circumstances which render the military service unpropitious to health, an opinion which the accurate investigations of Major Tulloch had led him to form a comparison between the mortality in the dragoon-guards and dragoons in the United Kingdom, and that of the civil population at the same period of life.*   The exposure of our sailors to the terrestrial emanations on which endemic diseases are supposed to depend, being only occasional, would lead one to expect that they should possess an advantage in certain classes of diseases, fever, for example, and bowel complaints ; but neither that it should be in any case so very decisive as it has been shown to be, nor that it should pervade every form of disease, of which we have traced the relative prevalence in the two services.   Why, for example, do the two services in the same climate fare so differently from consumption and disease of the liver?—a question we are unable to answer, however we may have indulged in conjectures.   We would suggest a diligent inquiry, in every climate, into the barracks, their site, ventilation, and space ; the food, clothing, and duties of the troops, and above all, that general moral management applied to soldiers, from which we quoted Dr. Wilson's Report to prove such great benefit had resulted in the navy.   On a former occasion we pointed out the fact how much bowel complaints in certain of our colonies had been diminished by the substitution of fresh for salt rations, (Brit. and For. Medical Review, vol. XI, pp. 67-8,) an amendment attributable, we believe, to Lord Howick.   Might not some equally intelligent and patriotic secretary-at-war gain golden opinions by pursuing the path his lordship has indicated, and still further ameliorating the condition and health of our gallant soldiers ?   In this, and all similar investigations, our ministers would find an invaluable pioneer and counsellor in Major Tulloch.

* See Major Tulloch's First Report, and Br. and For. Med. Rev., vol. VIII. p. 224.

We have now brought to a close our observations on these Reports. So often have we testified to the merits of Major Tulloch, as a statist and even as a medical reasoner, that in his case it is only necessary to say that his present Report is on the plan of those which preceded it, and equals them in execution.   In our previous article on the Naval Reports (Brit. and For. Med. Review, vol. XI. p. 182) we bore testimony to the editorial skill of Dr. Wilson, and his colleague Mr. George Mackeson, whilst we regretted that the defective system of nosology employed in the navy, (the best, however, at the period of its adoption,) impaired in no inconsiderable degree the value of their labours.   Though we still think that the employment of an improved nosology would at once have diminished the amount of Dr. Wilson's labours, and increased the accuracy of their results, we cheerfully bear testimony to the very great value and extent of the information contained in his Reports, regarding it as a vast addition to the knowledge previously possessed in that important branch of our art,—etiology.   We are of opinion, moreover, that the details given of the sickness, or rather of the health of the navy, are a proud eulogium on the hygienic arrangements of this branch of the service, and of the therapeutic skill of its medical staff.

P.S. Since the preceding pages went to the press we have seen, for the first time, a most valuable paper, by Major Tulloch, on the relative health of the Army and Navy, published in the Statistical Journal for Feb. 1841. We regret much that we had not the advantage of using this communication before; but we feel it necessary to lay before our readers several observations contained in it, also some derived from another source, as bearing most materially on the important discussion in the preceding pages.

I. The remarkable difference in the mortality of the two services may partly be attributable to the facilities in the navy for sending home patients whose recovery would be doubtful or protracted if they continued to serve abroad.   The proportion *invalided* on this account in the navy, compared with the army, is as 25 to 10; consequently the former service gets rid of the greater proportion of the chronic cases, which, in the latter, continue in hospital till they terminate fatally.

II. In the navy there are frequent opportunities of sending home invalids as soon as that change is recommended, but in the army they could not, till within the last year or two, be sent home oftener than once or twice in twelve months, however urgent the necessity; consequently, numbers perished while waiting for a conveyance, whose lives would probably have been saved had the means of transport to their native country been afforded at an earlier period.

III. When invalids from the navy return home they are forthwith discharged, unless unable to leave the hospital; but in the army most of them who have not completed a sufficient period of service to entitle them to a discharge with pension, are ultimately sent back to their duty, and their deteriorated constitutions contribute materially to increase the mortality in after years.

IV. The comparatively short duration of the sailor's service has also a powerful influence in keeping the mortality below what prevails among military troops in the same climate. Soldiers are enlisted for life, and in most instances continue to serve from 21 to 25 years consecutively,

while the average period of a sailor's engagement is only from three to four years; and as this engagement is, in every instance, preceded by a medical examination, at which all slight and sickly men are rejected, it must have a material influence in reducing the amount of mortality. The experience of Insurance offices shows the advantages of recent examination to be so great that several newly-established offices, consisting of 200 or 300 members have passed two or three years without a single death, a circumstance which never occurs among an equal number who have been longer assured.

v. Age also forms an important element in comparing the relative mortality of these two branches of the service. On this head the naval returns supply no detailed information, but it seems by no means probable that among men who only engage for a limited period the numbers at an advanced age can be as great as in the army, where the engagement is for life. In the navy, also, a large proportion consists of boys about the age of puberty, at which period of life persons are well known to be less subject to mortality than at any other.

This explanation will tend to relieve the results in the naval report from any suspicion of bordering on the marvellous, a character which might otherwise be assigned to them when the ratio of deaths from sickness in the Mediterranean is found to be under ten, and in South America under eight per thousand of the force annually, while that of the labouring population of this kingdom, at a corresponding period of life, is at least one half more. Even making all due allowance, however, for the probable operations of these causes in reducing the mortality, there is abundant reason for congratulation in the results, both to the philanthropist and the medical inquirer.

ART. II.

Erinnerungen an England. 1841. Von Dr. MARX, Königl. Hannoverschem Hofrathe und Professor.—*Braunschweig*,1842. 8vo, pp. 302.
Recollections of England. 1841. By Dr. K. F. H. MARX.

IT will be remembered that about a year and a half ago Professor Marx, of Göttingen, made himself known to many members of the medical profession in England, but particularly in London, as an ardent admirer of our country and its institutions, and as one not merely ready, but anxious to put the most favorable construction upon everything he saw and heard. The impressions made on his mind during his inspection of our country and its contents, were communicated from time to time to his brother, who is professor of natural philosophy at Brunswick. Being a physician he himself took the greatest interest in matters pertaining to medicine, and these consequently occupy the greater portion of the work. It is to these that our attention is necessarily and exclusively directed. We would state, however, that as Dr. Marx's brother was a layman, matters laical are also referred to and examined with the eye of a scholar, a gentleman, and of a studied but secluded philosopher. Of these matters laical we have only to say that all Dr. Marx has written is more or less amusing.

Our traveller made no stay in London after he had touched our shores, but went direct to Scotland, viâ York. His first breathing-time appears to have been in the modern Athens. As the impressions made upon his

mind on his arrival there indicate much of the character of the author, we are induced to present his account of them :

"He whose inclination and duty it is to follow scientific pursuits can only breathe freely or feel at home where the higher educational establishments are found.   To enjoy genuine satisfaction he must live in an intellectual atmosphere, and have objects presented to his notice interesting to his peculiar feelings. Nay, the very buildings around him must be congenial with his own pursuits. A visit to a fortress can scarcely be too short, although everything one sees is new and interesting.   A mercantile town, with its bustle and hurry, its harbour and exchange, its warehouses and promenades, soon excites a desolate feeling of weariness.   Even a metropolis, the residence of the court, with its parades, theatres, and saloons, affords but a transient excitement to the mind.   It is quite otherwise in a place dedicated to the muses.   Here the soul experiences an impressive tranquillity, an affectionate yearning, a sort of confidence and pride.   It is like returning to our native home ; like the enjoyment of the religion, the language, and the pursuits familiar to our hearts.   Here one can understand how like seeks like.   Here you may have that honorable position allotted to you, unrecognised by the world at large, and enjoy the peace and satisfaction only to be obtained in the society of intellectual men.   Such were my reflections as I greeted the Penates of the Scottish university."

The museum of human and comparative anatomy in Surgeons' Hall, and of pathology, belonging to the university, are all noticed admiringly ; as also Sir G. Ballingall, Sir C. Bell, Drs. Abercrombie, Christison, and Graham.   Dr. John Thomson had a sort of pilgrimage made to him :

"As for many years I had set a great value on the works of Dr. John Thomson, I felt anxious to know him personally and to express my gratitude for his important researches.   I heard with regret that he resided out of town, was ill, and had withdrawn himself from society.   The last circumstance raised my curiosity, for I felt certain such a man would not abandon social life without some sufficient reason.   I mentioned my wish to see him, at the hospital where his eldest son is professor of pathology.   He expressed himself ready to accompany me to his father's ; and one of the physicians present having placed his carriage at our disposal, we set out.   We found the old man in bed ; but I had scarcely had time to glance through the summer-house before he came to me, supported on a stick, and greeted me with affectionate cordiality.   He took me by the hand, led me into the garden, thanked me for my visit.   He spoke with so much animation, and such an unusual brilliancy appeared in his eye, and such tension (?—spannung) in his sunken features, that I began to feel anxious for him, and begged him to return.   He seemed to suffer in his mind because many eminent men, with whom he was formerly on the best terms, had criticised his scientific opinions in a harsh and unguarded manner.   He mentioned particularly his views respecting the treatment of syphilis without mercury.   He felt that he was misapprehended, and with this impression ceased to publish ; although this may have been rather in consequence of bodily weakness.   He leaves to his sons (the younger of whom, the professor of physiology, was present,) his valuable collections, that through these justice may be done to him.   I fully sympathised with him, and could only regret that I was under the necessity of declining his invitation to prolong my visit." (p. 25.)

The estimate of Dr. Abercrombie occupies nearly a page :

"John Abercrombie is one of the most popular physicians in Edinburgh. His published works exhibit accuracy of observation and soundness of judgment. He appears to be simple and unassuming in his manners ; and that he is so in reality was the general opinion, so far as I could learn.   It is generally understood that he goes too far in religious matters ; and I remember to have heard and read the same opinion about him in Germany.   The religious views of an individual belong exclusively to himself ; and it always appeared to me an impertinence to make them the subject of common conversation.   Certainly

a piety which displays no trace of weakness of mind, of ostentation, or of hy-
pocrisy ought not to be interfered with. Since I have discovered how much
true religion is found in the family circles of this country, how much attend-
ance at church is the result of feeling, and how generally the observances of
religion are maintained as a duty—the exception only being remarkable—I
should consider it hazardous to estimate an individual's character and qualifi-
cations from such circumstances. Certainly worthy persons may here be met
with in the medical profession who have found religion to be their greatest so-
lace under bereavement." (p. 26.)

And then we have a curious anecdote about Dr. Gooch. ◦

Our professor made his way to the Highlands, and found the gymnastic
exercises of his younger days to come in very usefully in facilitating his
jumps from stone to stone among the bogs. He seems to have been
delighted with the scenery, as we find him turning out for a walk at
Callander before cockcrow : an early hour indeed, as the month was
July.

Glasgow did not much interest our traveller. He left it without a
sigh, and makes his way back to London with all the haste of a stray
Cockney. " Paris," he says, " may be France, but London is England,
and all the world beside." He visits diligently the metropolitan raree-
shows, under the usual cicerones. The Zoological Gardens in Regent's
Park are much, and not too highly esteemed :

"I now turned my steps towards Regent's Park, to see the Zoological Gardens.
I have seen them—seen them by the hour, and shall see them again. When I
hear that this institution, like similar ones in this country, is supported by private
individuals, I cannot help asking how kings and emperors can bear comparison
with these untitled folk. The park at Schönbrunn contains some beautiful and rare
specimens, and the naturalist may be entertained by a ramble through the Jardin
des Plantes, and will laugh heartily at the *Palais des Singes;* but here he feels
himself as if in Paradise itself, when Eve gave names to all animals; or in Noah's
ark, where of all creatures there was a pair. The representatives of every
clime are here ; and also not only of every genus, but even of species and va-
rieties. I now saw, for the first time, a living orang-utang, and a giraffe with
its young. A rhinoceros and a gigantic elephant attracted the young people :
ladies rode on a little elephant. All but dangerous animals wander freely about
in their inclosures, and thus afford an excellent opportunity for observing their
habits." (p. 45.)

The professor compares the flow of population through the streets of
London, and the traffic of ships and boats on the river to the circulation,
as observed under the microscope, when the blood-globules are observed
rolling after each other, over and on, in continuous succession. The
Thames is the aorta of the world, and the Bank of England is the left
ventricle of London—in many matters he might have said of the world
too. Meditating upon the Thames Tunnel, it struck him that if Jupiter
was so hard upon Prometheus for stealing fire, what would Neptune
(supposing he had been alive) have done to Brunel for opening a road
into his territories ?

After a few days' residence in London our traveller forms acquaint-
ances and begins to criticise persons as well as things :

"This morning I was at the British Museum, in the afternoon at the Hunterian,
in the evening at Sir James Clark's—three things equally remarkable in their
way. You are aware, from reading, how astonishingly rich the British Museum
is in books, specimens of natural history, and works of art. I also had read a
great deal about it; but who can describe a diamond ? We must see the water,

the brilliancy and the colour of it, for ourselves.   The antediluvian animals and the Grecian monuments demonstrate the existence of bygone eras in creation and art.   Forms so wonderful as the former no longer exist on earth, and the hand of man will never again strike that magic chisel which brought out the flowing drapery in the statues of some Athenian females..............   The museum of John Hunter is the pantheon of its founder; the monument of a life full of industry and research: a most instructive museum of comparative anatomy.   Whoever has a taste for the study of this branch of science will see the whole of it before him.   All structures, organs, and organized systems are there, arranged with reference to their functions and their regular development, from the lowest animals to the highest.   The organization and final causes of animated structures are there exhibited to his astonished mind.   The nature-worship here celebrated is lawful ; for it is the admiration of creative power and human effort.   At Clark's I learned to love English honesty and cordiality. The image of this excellent man is become part of myself." (p. 51.)

Our astonished and admiring traveller gets up next morning early to write again about what he had seen during the previous day, for he had been almost overwhelmed by his own thoughts.   He adds, respecting the museum at the College of Surgeons, that it is a striking proof of what an individual may do, even with limited means, if he place his object clearly before him, and seek to attain it with prudence and perseve-rance.   He alludes to the catalogues, and says ;

" William Clift, the conservator, is a living catalogue.   He is extremely kind and courteous, and having been educated under John Hunter, reveres his memory very much..........   Whoever has a recommendation to him, or is a zealous student may go at all hours and study practical physiology ; if not so re-commended the visits must be during the appointed hours. Among the curiosities are the skeleton of a dwarf, aged seven years, whose mother was delivered of it during a storm, and while enclasped by an ape ; and the embalmed body of the wife of Van Butchell, the quack.   Her relatives agreed to pay this man £500 per an-num so long as she remained *above ground*.   When she died he stowed her away carefully in a glass case, placed her in a room, and continued to draw the an-nuity.   I must refer to the library at the college rather to notice the librarian, than the books.   This office is held by Dr. Robert Willis, who, when young, made a pedestrian excursion through Germany, with knapsack on back, and knows German literature and physicians.   He is a man of fine feelings, thought-ful, and truth-loving." (p. 55.)

A just tribute to Sir James Clark's worth is followed by a critique laudatory of the editor of the British and Foreign Medical Review, for which we tender our most respectful acknowledgments.   Then come Sir B. Brodie, Mr. Travers, and a couple of phrenologists.   Bright, Latham, Liston, Keate, and Lawrence are also visited.

" Although they all [all except the phrenologists] left on my mind an im-pression of sterlingness of character and frankness united with affability and kindness, I felt myself most attracted by Brodie and the elder Travers.   Brodie is rather short and slenderly built, has a compressed mouth and winning intel-lectual eyes.   He says little, but what he does say, has so much precision, and is so complete and comprehensive, that one cannot but wish to examine him more minutely, and in conversation, to follow up the experience and opinions of such an individual to their complete development.   Travers is tall and strongly built, and active in spite of his age ; true-hearted and social ; clear in expressions as well as in judgement."

The two phrenologists give occasion for a hit at the " pseudo-Æscu-lapian sect."

" As I went to Guy's Hospital I was induced by their signs and handbills to go to two phrenologists. For the paltry sum of two guineas Mr. Donovan en-

gages to teach you the difficult and useful art of learning people's interior from their exterior. That he was up to the thing he proved by feeling my head, and erected my horoscope with a diagnosis which dispelled all doubt about the matter. And truly his statements ought to have convinced me, as well as the opinion he gave respecting the individuals whose busts he had collected round him, and who, I believed, I knew either by their deeds or writings. Only there are innate aversions as well as ideas. Mr. Deville, near Exeter Hall, was out; nevertheless I went through his large collection of casts and skulls which is behind a lamp-warehouse. The doctrines transplanted to England by our countrymen, Gall and Spurzheim, afford a favorite pursuit to a portion of the higher classes; and have also given rise to a flourishing business. It may therefore easily happen that the bust of Elliotson, who is trying hard to bring animal magnetism into repute, should find little favour with the adherents of this pseudo-Æsculapian sect." (p. 57.)

Since our author's visit, however, phrenology and animal magnetism have shaken hands and kissed each other; and there is every promise of a goodly harvest under the conjunction of the star of the nativity-casters with that of the seers of the invisible.

As a companion-piece to the preceding, we give sketches of other pseudo-Æsculapians:

"A tooth-drawer recommends himself to the public by the comforting words 'toothach cured' displayed in his window; the letters being in the cuneiform character, and made up of carious teeth. A worm-doctor promises you the speediest possible cure; and modestly to insinuate that he may be depended on, close to his signboard 'Late Dr. Gardener's museum' is a collection of human and brute worms arranged in long bottles one above the other. The announcement 'dissenter medical office' made me curious to know what other remedies were used than those of 'high-church' medicine: they were Morison's pills."(p.58.)

Professor Marx thinks quackery on the decline in England, and thus accounts for the alleged fact:

"The herd of notorious quacks is much lessened, and also the number of nostrums. This circumstance, that is to say, the protection of the health against its most deadly foes, is rather to be attributed to the extension of right views among the lower orders, by means of cheap publications, than to the efforts of physicians or of a medical police. In fact the latter does not exist. It is the easiest thing imaginable to purchase poison; you may get it at the next shop; and either accidental or wilful cases of poisoning are occurring every day.

"You cannot go far in the streets without meeting a pock-marked person. We have forgotten in Germany that such a thing can happen, it is so rare. A man must travel into the native land of Jenner to witness an instance: and in this respect, he certainly will not become the panegyrist of unlimited personal freedom. In spite of the excellent institutions founded for the extension and encouragement of vaccination, and in spite of the numerous opportunities afforded for its being done gratuitously, many still inoculate for the smallpox, and raise a cry against vaccination—that truly God-like gift from medicine to man. Compulsory vaccination is not attempted, and could not easily be introduced or enforced." (p. 77.)

Following our traveller from St. George's in his journeyings eastward, we find him visiting St. Bartholomew's, Guy's, and St. Thomas' Hospitals; and from these he returns to University College. The museum at Guy's, Mr. Town's wax models, and Dr. Hodgkin's catalogue are noticed as being exceedingly meritorious. Surprise is also expressed at the extent of the London museums, especially of King's and University Colleges; and B. Cooper's, Langstaff's, and Kiernan's anatomical and pathological collections are referred to.

"Dr. Hodgkin is forty years old, but looks quite young; gentleness and kindness beam through every feature. Although in practice, he applies himself closely to pathological anatomy; and the collection at Guy's Hospital is almost his own creation; his works, as an author, are extremely good; and when we consider his multifarious engagements, it is matter of surprise how he can devote any portion of time to scientific pursuits." (p. 75.)

At University College the dissecting-room, the museum, and Dr. Carswell's drawings excited particular attention. The professor of comparative anatomy was found in his museum.

"Dr. Robert Grant is a modest Scotchman; following science quietly, and devoting his whole time to his own pursuits. He is a physician but does not practise, or rather, must not; since he refuses to comply with the strange regulations of the College of Physicians, which require him to pay handsomely for the permission to practise, although he got that permission long since at Edinburgh. He was acquainted with Cuvier and wrote his life in the Foreign (Quarterly) Review for 1830; Cuvier, while living, having communicated to him some particulars for this purpose." (p. 79.)

Dr. Paris carried the wandering professor off to two or three clubs, and raised admiring envy in his German heart as the only individual he ever met in the profession who had got a thousand pounds by a medical publication. A club, our comfort-loving bachelor (the professor *must* be a bachelor,) characterizes most poetically as an "Alpine height of pure air, a free port of leisure, a triumphal arch of comfort." To bachelors clubs are paradise itself; as everything is to be met with in them except wives and children. And then he gives a list of delights, ending with the cellar and kitchen, and shrewdly remarking that the latter, although prolific of every luxury, by no means emaciates the purse.

After the clubs comes the Isle of Wight. Beautiful he acknowledges it to be, but London is all in all to him; and back he flies to the witty, learned, and intellectual society of the metropolis. Then we have peeps into everything. The Penitentiary, the Duke of Wellington going to Parliament, Bedlam, drawing-room etiquette, (Dr. Marx is an impassioned admirer of our dear, fair, countrywomen,) carpets, stoves, and tobacco-smoking. The latter practice, curiously enough, is an abomination in his nostrils; and he gives it a "counterblaste." He quotes all the physicians he has met with, as authorities against the practice of smoking, and Dr. Prout especially, as maintaining that it changes the blood, so that it becomes of a yellowish or greenish colour; and this explains why smokers have such dirty cachectic complexions! The admirers of the hateful weed suffer also from stomach complaints, of which, and of diseases of the liver they often die. "But what's the use of talking?" says the professor. "The snuff-taker thinks it an agreeable thing to powder his nose and everybody about him with his artificial pollen; and the smoker considers that people ought to be much obliged to him for smoking into books, so that it is hateful to read in them after him." *De gustibus,* &c. We know and have heard of wise men and worthy men, aye noble men and royal too, who love a pipe, and have no stomach complaints, nor are likely to have or to die of diseased liver; although, at the same time, we altogether sympathise with Dr. Marx in his reprobation of the filthy custom. Amongst other things we must pass over our traveller's criticism on Mr. Wakley and eulogy of Dr. Holland, to make room for a visit to Hanwell and its "palace-like asylum." The day found convenient for the visit was a Sunday.

" Nine hundred and twelve madmen in one day! I may really be supposed to have spent a *madman's* Sunday. Yet I have seen this day much wisdom and philanthropy. Dr. Forbes took me to Hanwell Asylum, where Dr. Conolly, his friend, is the superintending physician. The air was warm; the sky a little clouded; a slight rain had laid the dust. In a while, the sun broke out, and his rays were reflected from myriads of glittering drops. The villages on the road were like sweet little towns; a great number of villas, all inviting from their neatness, elegance, and simplicity, alternated with parks and fertile fields. The numerous church-goers, the stage-coaches full of neatly-dressed young women, and the 'gigs' containing a single party, gave the eye occupation enough while the ear drunk in the chatty conversation of the friends, as the bee, the honey of flowers.

" The large establishment is in a pleasant situation, surrounded by beautiful gardens and quite detached. Unfortunately, Conolly was ill; so that his charming son and daughter were our guides. The latter, still of tender age, yet a vigorous young lady, wandered through the apartments of both the male and female lunatics like the good genius of the house. The noisy she stilled by a gentle reproof, the obstinate by a soothing appeal, the suffering by a comforting shake by the hand. Her father's principle lives in her, namely to treat the patients with the most perfect quietness of manner, and not to reason or talk much with them; as so doing only excites them. The person who is thoroughly firm and self-collected, while he exhibits the purest humanity, will certainly make the deepest and most beneficial impression. Here is practically shown man's power over man, when wielded with humanity. [We cannot resist the temptation of giving this last sentence in the original, as no translation can do justice to its idiomatic force and beauty: it ought to be engraved on the front of Hanwell, and over the name of John Conolly :—*Hier wird durch die That bewiesen, was der Mensch über den Menschen durch das Menschliche vermag.*]

" The principal object of Dr. Conolly and the assistant-physicians is to be as friendly as possible with the patients, and win their confidence. This object is less readily attained by an imperious demeanour than by kindly expressions and a kindly manner. The assistants and keepers amount to eighty individuals. The matron, keepers, and nurses also exhibit a systematic feeling of kindness and affection towards the unfortunate inmates. Corporeal punishment is never practised, nor is a strait-waistcoat or girdle ever used. Here the use of these things is considered to be like adding fuel to fire. Watchfulness over the patients is the most important duty; but such measures as may assist and minister to the comfort of the keepers are not overlooked. The revolving chair is now never used. The means of restraint commonly practised—not as a punishment, but with the object of curing the patient or of maintaining order—is a seclusion for two or three hours in an airy court, or in an empty but clean apartment, so as even to remove the very idea of this being a measure of punishment. If the patient refuses to go in, he is not forced, but the other patients are sent away, and he is surrounded by courageous yet kind-hearted keepers who attempt to persuade him to go of his own accord. Force is only met by force, when the patient uses violence, and then only in self-defence, as a matter of necessity, and without appearance of passion.

" To remove wakefulness the patient is allowed to drink freely of cold water. When the shower bath is used to allay excitement, it is customary to place the patient in warm water up to above the middle; then to dry him quickly, cover him up warm, and send him to bed. Woollen clothing is considered the most suitable on account of the great variations in the weather; and also, because the insane have generally cold hands and feet. During the hot days of summer, a thinner clothing is permitted.

" A beautiful principle runs through the whole of this excellent physician's curative method, namely, still to consider himself as a learner, and the patients, whether well or ill-behaved, as the teachers from whom the right method is sure to be gleaned at last. Marks of attention and encouragement, instead of neglect, are often most useful in (apparently) incurable cases. The whole

manner of individuals, who were all but given up on account of their intractable violence, is quickly changed when they are got to busy themselves with some decent and congenial occupation. Every patient is employed as much as possible; in the kitchen, washhouse, garden, or at handicraft occupations. Many lunatics being brought into the asylum quite uneducated, even unable to read, measures are taken to educate them. Several opportunities have been afforded for proving that the very first impression made on patients coming in, has produced a beneficial alteration in their state. Not a few have left this retreat quite well two or three months after their admission.

" According to the experience at Hanwell, the propensity to suicide is nearly always connected with some bodily disorder; and it is found to be the best plan to set the patients free from all restraint; simply watching them and keeping everything dangerous out of their way. The more obviously their actions are restricted, the more their mind becomes fixed on the propensity. Severity and restraint tend to keep the propensity alive. An attempt at suicide is frequently made by young girls, and is merely an hysterical symptom; on this account, everything should be kept as quiet as possible. In these cases, the best treatment is to moderate the too-busy proceedings of the bystanders, to send them about their business, and merely to keep the light excluded, the hands and feet cool with cold water, and all means of destruction carefully removed. . . . . Going from the kitchen to the dining-rooms, you would scarcely believe that those who are so busy cutting potatoes, washing pots, carrying water and plates of provisions, are the same who only a few days previously disturbed everybody about them, and were the most refractory of idlers. Of the scourge which formerly was so rife in these institutions there is now no more trace; and only the hand remains ready to resuscitate the apparently dead in intellect. Instead of the chains which formerly riveted the maniac to the block, there is simply the feeling that kindness must ever be the attendant on misfortune.". . . . . .(p. 140.)

Oxford was visited by our admiring friend, and its " remark-worthy" things observed with all the enthusiasm of the man of literature and the student; his graver observations being interspersed with a little small talk. Radcliffe's lucky escape from an unpleasant matrimonial engagement is detailed. A peep into the academic theatre gives him occasion to observe that it was the place in which Blucher was created a doctor after he had defended his thesis at Waterloo. The portrait of another master of disputations, the Duke of Wellington, in his robes as Chancellor, graces the same building.

Professor Marx informs us, to our great satisfaction, that he found Dr. Buckland domiciled in Christ Church College as comfortably as if he were in Abraham's bosom; and thinks there are few such reverends as he is, considered as a geologist, mineralogist, and a man of good common sense; not to mention his enjoyment of a pleasant joke. Our author had published an interesting memoir of Blumenbach (a translation of it appeared last year in the Edinburgh Philosophical Journal) in which among other things we find it stated that that master in science was a bad writer, on account of having been obliged to write with the left hand from having suffered an injury in the right. But Blumenbach had been a diplomatist at Paris, and had there learnt the trick of *writing in his pocket* on a bit of stiff paper. So when people quizzed his writing, he never failed to acknowledge its defects, but also never failed to ask his critic if he could write in his pocket? Mrs. Buckland being a lover of German had read this memoir of Marx's, and took the opportunity of asking our travelling critic if *he* could write in his pocket? He candidly acknowledges his want of that accomplishment, and broadly asserts it is by no means common with the Teutonic race. The architectural gran-

deur and princely abodes which learning exhibits at Oxford and Cambridge are unequalled, our professor thinks. It is evidently the first wish of his heart that Göttingen should be like them. It is certainly more like them than any other university in the world. Surely this may be somewhat consoling to him.

It was the fair at Oxford, and our author (who lets nothing escape him) observes that Oxford gingerbread is tougher and more clammy than German. We think there is some mistake here; he must have got hold of brandy-snap. The beds he found to be very comfortable, and the more so, because he could indulge the whim of stretching across them; being an agreeable change from the longitudinal reclination to which the descendants of Hermann are confined when dormant in their *interpulvinary couches*.

Indulging in some reflections on the constitution of the English universities, Professor Marx observes that the German universities lose much by not maintaining a connexion with their students after their introduction into life; a connexion secured by the peculiar constitution of the English universities, and to which they owe much of their present grandeur, wealth, and influence. We recommend this hint to the friends of the University of London.

While on a visit to a sick friend at South Lambeth, Professor Marx got initiated into the way of getting on in London. A physician must be a boasting, ubiquitous, bustling, intriguing fellow to get on fast, or indeed at all.

"Quiet merit, unless very great, is scarcely estimated. But the man who talks about his cures, makes himself conspicuous everywhere, and in addition has cunning enough to carry out his schemes, is considered by the public to be a practical man. On the other hand, the modest, learned, and thoroughly educated physician, who has not the tact or inclination to push himself forward, or who remains at home and only leaves his study when need is, passes for a learned man. It is thought he knows more of what is written in books than of what is done in the world. I once mentioned in company the name of a physician whose skill at the bedside I had often witnessed with admiration; and all that could be said of him was, that he was a bookworm. I answered with the remark that his solid acquirements in science constituted only the groundwork of his professional skill. But I was told without ceremony that that was not the case; that nobody had heard of his cures, and that it was only practical readiness that raised a physician." (p. 193.)

One can easily imagine how such doctrines must have jarred the feelings of an educated gentleman and an accomplished physician. It is too common for half-educated quacking practitioners so to abuse the public ear, and utter such sentiments against not only an educated but a highly skilful practitioner. The plan has the double object of making their own ignorance meritorious, and the merits of their competitor injurious to his success. We hope that those who are seeking to restrain quackery will begin with quacks of this description, as the most unrighteous and dangerous of the whole tribe.

The character of the English physician, though sketched with the pen of an admirer, is, on the whole, given correctly. And first as regards his scientific acquirements:

"The English physicians know little of scientific medicine. They are wanting in systems. With them theory has not interpenetrated experience. Anything of the kind they display is no more than an insipid eclecticism. They

think little of arrangements and deductions founded on or flowing from funda-
mental principles. Their science is not the product of pure thought; it is a
mosaic work of observations. If subjects of the kind be brought under the no-
tice of an Englishman, he scarcely understands you; and when you try to make
him comprehend your meaning, he will say, we must be just before we are
generous. They insist that people should busy themselves with substantial reali-
ties and not fine-sounding words. The construction of philosophical theories,
and the dressing up and arrangement of facts and general propositions are cer-
tainly not their forte. But it would be matter for regret if they were to fritter
away their sound sense, enlightened judgment, and innate truthfulness in an in-
finity of subtle distinctions; or become mystified by the opinions of the theo-
rizing metaphysical school. Their native love of freedom repels
the stays and strait-waistcoats of a system. Inhabitants of a country which
carries on an intercourse with the whole world, they are accustomed to a wide
horizon, and from an early period are practised to distinguish the apparent from
the real. They think that this is peculiarly the duty of the physician; that he
must examine each fact in its varied and almost infinite relations as clearly, ac-
curately, and precisely as possible; and then arrange the results logically, ex-
pressing them under plain and perspicuous propositions. Poets only may be
permitted to weave the silken threads of imagination, and philosophers plunge
into the depths of pure thought to bring up mere idealities, useless fantasies
and systems, or wander after cold and desolate generalities. I had already
formed opinions of this kind respecting the English physicians and the tendency
of their scientific pursuits from a perusal of their writings. A personal ac-
quaintance with them at the bed-side, in their public institutions, and in their
schools, has only served to fix and extend these opinions." (p. 204.)

A young practitioner pointed out two carriages at the door of a house,
with the remark, that they belonged to two distinguished physicians,
who, although not on good terms, had often to meet each other in con-
sultations. This circumstance affords an opportunity for expressing an
opinion on the moral character of the profession:

"The understanding between physicians is otherwise very good. Love and
hate are everywhere; but especially in a country where ready money gives in-
fluence, and influence, honour; and where party-spirit finds herself at home.
But they meet often in private company, particularly at table, and are often called
into consultation together; so that an undisturbed and calm judgment is enabled
to triumph over prejudices and feelings. The consequence of this good colle-
giate understanding among themselves, in connexion with their gentlemanly
demeanour, their independent circumstances, their superior general education,
their moral integrity, and their great skill in the practice of their profession, is,
to be so honoured and esteemed by the public, that you can never hear a dis-
paraging or injurious remark spoken against their profession." (p. 208.)

A call at a medical bookseller's gives our author occasion to remark
on the evident want of a taste for the study of the valuable old authors.
The bookseller, the young practitioner, and our author, are each made to
express their sentiments in a dialogue, the first-mentioned concluding it
with the assertion that a complete edition of the medical classics would
be a bad speculation, and would only be undertaken by subscription.
This bookseller further adds, that so far as he is acquainted with living
medical authors he doubts whether the older writers have any attractions
for them.

It is possible that Professor Marx has not rightly interpreted this book-
seller's sentiments, but has supposed that the writing public is, in England,
as numerous a body as in Germany, and guides the reading public. This

is manifestly a mistake. We are ready to admit, that hitherto a taste for the older medical authors has not been generally diffused. That deficiency, however, has arisen simply from the general want of a good preliminary education. These old authors are the poesy, antiquities, and belles lettres of medicine, and it will be found that just as the standard of general education is raised in the profession the taste for them will be increased. This taste is in process of development; and, in proof, we need only refer to the wishes made public, from time to time, for the formation of a society that shall expressly devote itself to the republication of the medical classics, ancient and modern. Several gentlemen have, within these two years, taken pains to recommend such a society, and we understand it is now forming. We heartily wish it success; and the more heartily, because such a society would be able to republish the works of the authors alluded to in a cheap, and at the same time, neat form. The perusal of these is the proper finish to the mere academic education of the practitioner. They might be read during the leisure of commencing practice; and, while they would solace the many anxious hours peculiar to that period of life, would enable the practitioner to appreciate the merits of those literary charlatans who conceal a few old sterling truths in a mass of their own nonsense, and then, with incredible confidence of assertion, pass them off on the medical public as their own great discoveries.

Our traveller passes from medical literature to practice, and gives the reasons why, in his opinion, our doses of medicine and our treatment generally, are so Herculean. The patient is not visited sufficiently often to carry out the expectant plan; and the people are so accustomed to strong foods and drinks, that they have little reliance on any other than strong medicine. This, the forty-second letter, is concluded with some reflections upon medical authorship in England, which are interesting.

In the remaining fifteen letters we find numerous matters and things viewed, re-viewed, and meditated on;—Dr. Paris, and Sir J. South; Cambridge, and the peculiarities of English Universities; Broome Park, and its respected proprietor, Sir B. Brodie, of whom we have a just estimate; Mr. Guthrie, and a comical note about the great cost of becoming a surgical examiner; Dr. Holland, who, treating Trojan and Tyrian alike, had just come from a professional visit to Viscount Melbourne, and was just going on the same errand to the Earl of Aberdeen; University and King's Colleges; Dr. Sharpey and Thomas Morton; hospital practice and dispensaries. In the last letter, dated from Paris, we have traveller's gossip; a comparison of the two nations he had visited, by no means favorable to the French; and a sigh divided between England and Fatherland.

We had marked several passages for special notice, but our allotted space is filled. We can only say that the "Reminiscences," written as they were, on the spur of the moment, are extremely interesting from their graphic yet simple style. As our German friend has behaved so handsomely to our countrymen, while criticising them, we cannot do less than close our critique on himself with an adieu in the high German fashion, yet sincerely from the heart,—so we say to him,

Leben sie wohl.

Art. III.

Clinique Chirurgicale de l'Hôpital de la Pitié. Par J. Lisfranc.
Tome premier.—*Paris*, 1841.   8vo, pp. 696.
Clinical Surgery of the Hospital of La Pitié. By J. Lisfranc.—
Paris, 1841.

We resume the analysis of this important work, left imperfect by the
article in Number XXVII.

Necrosis and Caries. 1. Amputation is, as it ought to be, rare in the
treatment of necrosis. Yet M. Lisfranc thinks that it is performed more
frequently than necessity demands; and wisely inculcates a careful diag-
nosis as to the extent of the disease, before so harsh a remedy is actually
resolved on.   Though the discharge be copious, the fistulæ numerous,
and the soft parts extensively involved, still the necrosis may be limited
both in surface and in depth, and very far from requiring removal of the
limb; in fact the source of all the secondary mischief may ultimately
prove but little larger than the thumb-nail.   Nature is adequate to the
cure; we have only to assist her occasionally.   When she has succeeded
in fairly detaching the sequestrum, and is working towards its extrusion,
we may be of signal service; previously and subsequently to this, we
should be contented in most cases with practising " la médecine expec-
tante."   2. Again we express delight and comfort at such sentiments as
the following, emanating from Parisian surgery : " Be in no haste to ope-
rate, especially when there is no danger in delay.   Let us limit anew the
operative department of our profession; for never is surgery so beautiful
and brilliant, as when obtaining a cure without the destruction of any
organ, without plunging the bistoury into quivering flesh, and without
causing the effusion of blood."   Such words do credit alike to the heart
and head.   Would that the feeling was more strictly acted on !   3. But
again have we to find fault with M. Lisfranc in regard to the absorption
of sequestra.   He now not only asserts plainly that such is possible, but
maintains that it is of frequent occurrence; dragging in a certain M.
Malespine as particeps criminis in his offence against sound surgery and
common sense.   A *dying* portion of bone may be partially reabsorbed,
and may be wholly disintegrated by a vital process similar to what effects
the major share of rapid ulceration in the soft tissues; but *dead* bone is
liable neither to absorption nor disintegration, nor any other vital action;
and moreover has but little prospect of being much altered by chemical
or physical causes, until after its extrusion.   Because M. Malespine
finds an empty cavity in the interior of a bone, he has no right to an-
nounce forthwith, and on his own mere *ipsè dixit*, that this vacuity has
been occasioned by death of the cancellated texture to a corresponding
extent, and that the sequestrum has subsequently been wholly absorbed.
Had there been a genuine sequestrum, that is, a dead and detached por-
tion of bone, it would have remained cooped up in the interior, little
altered if at all, until nature assisted by the surgeon had devised and ac-
complished means for its removal.   Would it not be as easy, and infi-
nitely more feasible, to suppose that the bone, which originally and nor-
mally occupied the place of this cavity, was not at once killed, and then
eaten up by the absorbents at their leisure; but that by ulceration, pre-

ceded and assisted perhaps by interstitial absorption, it has been gradu-
ally disintegrated and removed, the disappearance of the osseous texture
keeping pace with the advancement of the process? This process may
advance more rapidly at certain periods and points than at others, and
then small portions of bone may be actually necrosed, and lodge in the
bottom of the cavity, unfavorably complicating the case. How often do
we see caries and a shade of necrosis combined? But M. Malespine
finding such portions, at once concludes that they are the debris or
residuum of the large sequestrum, and triumphantly appeals to them as
proof irrefragable of his theory: "The sequestrum was here and has
been demolished; here are its bones!" But why should the absorption
which devoured the large fragment so easily, tire of or choke on the
fragments? A man who has eaten a whole cow need not worry on the
tail, and certainly is expected not to permit fastidiousness of palate to
spurn this ultimate morsel. But the truth is, the absorbents reject the
large just as much as the small portion; they are not vultures, to feed
on carrion; they are vivivorous cannibals, and live upon their next neigh-
bours; they are given to habitual thirst, and will not hesitate to slake
this on fluids animate or inanimate; but they will not touch solids
which have ceased to possess the charm and the flavour of vitality. In
short, by a vital process, just as different from necrosis as ulceration is
from sloughing, the bone has been gradually reduced to a fluid condition;
part of which fluid may have escaped externally, part may have been
absorbed, and part remains in the cavity; this last containing not the
debris of dead bone, but small individual sequestra, the formation of
which has complicated the process, and which never will be absorbed,
but are destined to be extruded along with the fluid in which they float,
be that when it may. Such we hold to be the rational explanation of
the internal cavities of M. Malespine. And once more we protest
against such doctrine as he, aided and abetted by M. Lisfranc, has pro-
pounded. It is not only false in theory, but most dangerous in its prac-
tical tendency; inasmuch as he who leaves and wilfully deserts a loose
sequestrum, already cooped up by substitute bone, in the hope that it
shall be absorbed—and assists not nature to expel what is to all intents
and purposes a foreign body—commits a grievous surgical error of
omission, for which much active and skilful exertion subsequently may
be unable fully to atone. 4. M. Malespine wishes to make out that
tubercular degeneration of the cancellated texture of bone occurs much
more rarely than is supposed. We hope he may be right. But still,
supposing that he is so, it does not follow, as he infers, that the aforesaid
cavities must be occasioned by necrosis. The interior of the bone may
be and often is simply disintegrated, without any previous deposit of
any tubercular or other morbid product. 5. In caries, cure is not to be
hoped for until after removal of the carious portion by knife or cautery.
But before proceeding to such an operation, it is not enough that we ac-
curately diagnosticate the nature and extent of the degenerate ulcer.
The surrounding soft parts are frequently the seat of an acute inflam-
matory action; and this must be subdued, before operative interference
with the bone can be attempted with a just hope of success. 6. The
actual cautery is preferred to the potential by M. Lisfranc. We dis-
agree with him. The hot iron not only destroys the parts actually dis-

eased, but likewise depresses the vitality of those immediately adjoining, thereby rendering them prone to the assumption of a carious action; and thus, after separation of the slough and sequestrum that follow the application, a carious instead of a healthy surface may be found beneath, if not immediately, at least long before the cicatrization of the wound. The potential cautery, of which the most convenient forms here are the chloride of zinc and the red oxide of mercury, destroys the original caries and does not predispose to the formation of a secondary. But when circumstances will permit, all caustics ought to be superseded by cutting instruments.   7. Messrs. Lisfranc and Malespine regard interstitial absorption of bone as of little moment, and as being merely the result of neighbouring suppuration of bone. On the contrary, observation has led us to believe that caries is *preceded* as well as attended by interstitial absorption, in and around the site of the principal disease; and that such a change of the bone is consequently always to be looked on with much suspicion, not on account of its own intrinsic merits, but as a precursor of one of the gravest forms of surgical malady.   An open cancelled condition of the bone seems to be the essential nidus of caries.   In the spongy heads, but little has to be done in paving the way for its accession; in the shafts and other sites of a laminated texture, however, the interstitial absorption has been in progress long before the actual caries appears.   And in such situations we believe that caries has often been prevented by suitable treatment, (rest, counter-irritation, and attention to the system,) directed to the arrestment of this preliminary change in the normal texture of the bone.   Again, then, we are not differing with our author on a mere point of theory, but on an important principle, highly available in practice.

Nervous Ophthalmia. The affection so named by M. Lisfranc is a good example of local *irritation* in contradistinction to an *inflammation;* in other words perverted action of the nerves, rather than of the blood-vessels of the part.   The symptoms are lachrymation; no morbid appearance in the interior of the eye or on the cornea; marked photophobia; the eyelids carefully shut; on opening the eyelids, the patient feels as if points of nails were being driven into the globe; the conjunctiva is slightly reddened, but does not appear swollen.   In the treatment, antiphlogistics fail.   Extract of belladonna is to be rubbed on the temples and around the base of the orbits night and morning; sometimes the same medicine may be administered internally.   In a few days the cure is complete.   Finding such irritations of a mucous surface externally, closely simulating the state of inflammation, M. Lisfranc is naturally led to conclude that probably similar conditions and simulations may not unfrequently exist internally; and that many pains in the stomach, bowels, urethra, &c. supposed to be inflammatory, and yet resisting all antiphlogistic and revulsive means, may be dependent on mere irritation, and ready to yield almost at once to narcotics.   We agree with M. Lisfranc in thinking this extremely probable.

A chapter on hard circumscribed tumours of the eyelids contains nothing new, and requires no comment.

General rules regarding the extirpation and amputation of tumours. By "extirpation" M. Lisfranc means removal of the tumour alone; by amputation, ablation of its investing integument also.   We do not in-

tend to follow him through all his "rules," many of them being trite
enough, and chiefly connected with the mechanical department and its
minutiæ; but shall briefly notice some axioms both interesting and im-
portant : 1. Having made a section of a tumour after its removal, it is
very easy to determine its exact character, and to bring it under some
item of a definite classification of such formations ; but previously to
operation how difficult is it for even the most experienced, in not a few
cases, to predicate with accuracy the structure and tendency of the
swelling.   How often has hydrocele been confounded with sarcocele, and
sarcocele returned the compliment ?   Chronic abscesses have been held
to be solid formations, and their excision accordingly attempted ; aneu-
risms have been thought abscesses, until the gush of arterial blood that
followed the plunge of the bistoury, at once undeceived the surgeon, and
filled him with consternation ; Dupuytren mistook a fatty tumour in the
orbit with a large vein on its front for an aneurism by anastomosis ;
Lisfranc cut down on what he supposed to be an exostosis, but which
turned out to be a fibrous tumour of the soft parts ; and we venture to
say that the candid confession of every surgeon, however eminent—nay,
the more eminent the more likely—would disclose many similar blunders
in diagnosis.   The practical deduction we would make from this is that
no surgeon, however skilful and experienced, however preeminently
gifted with the tactus eruditus, is entitled at once, and as if intuitively,
to pronounce on the character of any tumour, and thereupon act incon-
tinently ; but ought in all cases to be patient, searching, and careful in
his manipulations, neglecting to employ no legitimate means towards the
obtaining of a true conception of the case.   M. Lisfranc's deduction is
somewhat similar, but not exactly ; he urges the propriety of an almost
indiscriminate use of the "exploratory trocar."   Now we hold that this
ought always to be the last means of diagnosis which is resorted to, and
not until all others have been patiently and well tried, and yet proved
unsatisfactory ; and not even then, unless both patient and surgeon have
made up their minds instantly to proceed with the extirpation of the
tumour, if such it prove to be ; otherwise much mischief is likely to result
from the indulgence of what under the circumstances may be not inaptly
termed an impertinent curiosity. All tumours, however simple originally,
are apt to degenerate ; and the ordinary cause of degeneracy is an ex-
cited action of their blood-vessels, which induces a sinister change in the
character of their perverted nutrition.   A blow ; a casual inflammation
in their vicinity ; the absurd attempts to discuss them, which we formerly
reprobated ; habitual pressure, are all very likely causes ; but none so
likely as the perforation of their interior by an exploratory needle or
trocar.   We have more than once traced the untoward effects of this in
the subsequent history of the case, and more especially in the section of
the tumour after its removal at a remote period.   From the hour of
puncture the progress of the tumour was markedly accelerated, and all
its characters rapidly changed for the worse ; its section disclosed an
originally fibrous or simply sarcomatous growth, fast becoming entirely
encephaloid, and the nidus of this nefarious deposit was obviously in the
track of the trocar or needle, as indicated by a bloody infiltration of the
encephaloid substance, always a most ominous sign of present and future
malignancy.   Many surgeons evidently have no fear of any such casualty,

and hesitate not to practise an exploratory thrust, as if it were a simple and innocent manipulation; boring tumours in search of pus, serum, or blood, as unconcernedly as an exciseman might probe a wain of hay in search of fluids more plainly contraband. According to our thinking, they thus, in nine cases out of ten, ensure a speedy and certain degeneration of the solid growth thus fruitlessly tapped; and we hold, therefore, that such exploration, as formerly stated, is only to be had recourse to in very doubtful cases, when other manipulations have failed to satisfy; and then only with the patient on the operating table, or prepared to ascend it at a moment's notice. 2. A tumour placed over the course of large nerves, blood-vessels, or other important organs, may seem to be completely separate from them; yet in many such cases the operator finds during his dissection that his previous examination has deceived him, the prolongations of the tumour often extending to a much greater depth than was externally indicated. Against such surprises, therefore, he should be upon his guard; forewarned he is forearmed. Several appropriate cases are adduced by M. Lisfranc in support of this axiom: among others that of a girl, who had a fatty tumour on the back of the neck, moveable and apparently superficial; in dissecting it out, however, M. Lisfanc had to expose the ligaments of the spine: no accident interrupted the recovery. 3. Some pendulous tumours of a narrow pedicle enlarge remarkably in their free portion, and cover a large extent of surface. In removing them, it is well first to amputate this pedicle on a level with the surrounding skin, as then the dissection for extirpation of the remainder can be conducted more easily and more accurately. 4. Moveable carcinomata of the breast may yet be deep and dangerous in removal; having become incorporated with the fibres of the pectoral muscle, and not gliding *on* these during manipulation, but *with* those on the subjacent tissues. It is only by very careful examination that such a condition of parts can be previously determined. 5. Pendulous heavy tumours sometimes by their own weight withdraw their deep attachments, which become more and more superficial. Art may sometimes assist nature in such retiring and commendable tendencies of the morbid formation. 6. Integumental incisions are much facilitated by previous tension of the skin; but when lines or points are important guides to the relative anatomy of the subjacent parts, while they are stretched, let them not be displaced; take for examples, the raphé of the perineum, and the lines indicating the site of the articulations. 7. As a general rule, the line of incision should be parallel to that of the subjacent muscular fibre; but to this there are exceptions. When important blood-vessels or nerves are concerned, we cut in the line of their course, and so run less risk of injuring them. In the forehead and face we often cut nearly transversely to the line of muscular fibre, finding it to be of more importance to be in the line of the habitual integumental folds, the result of muscular action. But such exceptions, as in other cases, only strengthen the general rule. 8. Incisions for the removal of tumours ought to commence where the principal blood-vessels and nerves enter, and advance steadily from that as a starting point. The nerves are cut at once, and thus the subsequent dissection becomes comparatively painless; the arterial trunk is compressed as soon as cut, and the operation in consequence is also comparatively bloodless. Following an opposite course, much blood is lost, an

unnecessary number of ligatures may be required, and a severe amount of protracted pain is unwarrantably inflicted. In removal of the mamma for example, the elliptical incisions are commenced at the border of the axilla, and the dissection proceeds from that towards the sternum. 9. Free incision we formerly advocated in deligation of arterial trunks. We think equally well of the principle in extirpation of tumours; and therefore agree readily with M. Lisfranc in recommending its adoption, when not inconsistent with the safety of important neighbouring textures. 10. Deep walls of fat are inimical to adhesion of a wound. In operating on subjects of obesity, it is therefore advisable to remove a suitable portion of the subcutaneous fatty texture along with the tumour, by inclining the knife in an excavating posture. 11. In removing malignant tumours, especially the cancerous, we have two errors to avoid; too sparing, and too free removal of the integument. If over anxious to have an easily coaptating wound, we may spare skin and cellular texture already involved in the agency of the morbid product, and consequently certain soon to produce the disease in a worse form of malignancy. And if we remove a large extent of integument, the part will be prone to a return of the tumour, in consequence of the irritation caused by the tightness and puckering of the cicatrix; also experience shows adhesion to be more favorable to immunity than is tedious granulation. When in doubt, however, it is surely well to err on the safe side, and sacrifice everything to full and free removal of the diseased parts. 12. A large artery or nerve passing through a diseased formation may seem to be hopelessly incorporated with its structure. Yet if the tumour be not mali moris, the artery or nerve so situated is not to be rashly sacrificed in either the planning or execution of the operation. They are in a bad neighbourhood, badly employed, yet may pass innocently through without being at all implicated in the nefarious proceedings, as experience has again and again shown. A fine elastic cellular texture often permits the tumour to be extirpated wholly, without injuring arteries, veins, and nerves so circumstanced; gentle coaxing traction by the fingers, and pushing by the handle of the knife, ought to precede the use of the sharp edge in such dangerous localities. 13. During such gentle tearing and stretching of the cellular texture, however, be on your guard against the entrance of air, especially into veins; for experience has shown that such an accident is more likely to occur then, than during straightforward simple incision. 14. When it becomes necessary in a deep situation to divide a cellular prolongation of a simple tumour, in which a considerable arterial twig is placed, beware lest by its elasticity the bleeding point recede beyond your immediate reach, requiring a difficult and dangerous dissection for its subsequent security. Put in force the same precautions as in section of the cord during castration. Having already reprobated the system of digging into axillæ for glandular enlargements of a malignant character, *our* remarks are not directed to such cases. 15. When the case of a large and deep tumour involves a difficult and dangerous dissection, this may be facilitated by removal of the principal part of the growth already exposed; simple bisection of it may sometimes answer the same end. Should any considerable vessel or vessels, however, traverse the structure of the tumour, such procedure might prove both troublesome and dangerous. Partial emptying of the contents of a stout and large

cyst may, on this principle, facilitate its removal when deeply situated, as at the angles of the jaw. The peritoneum is more easily separated from the abdominal parietes after opening of the abdominal cavity, than when this is entire. 16. When the knife has gone as deeply as seems consistent with safety, the remainder of the tumour may be attacked by ligature, that is, when the growth is of simple texture and innocuous tendency ; as in the removal of central goitres, whose increase is seriously interfering with respiration.

On the treatment of l'esthiomene or *dartre rongeante.*" 1. We have already reprobated empiricism in the treatment of burns and bruises, and would now do the like in regard to this complaint. Many and excellent remedies for it are frequently used too indiscriminately. Cauterization is the most powerful and most generally employed ; yet will often not only fail to amend, but be sure to injure. The " liquid acid protonitrate of mercury" is preferred by M. Lisfranc, employed according to the following principles. 2. When acute and constant pain accompanies the disease, and redness of the sore and its neighbourhood is very marked, cauterization then employed will but add fuel to the fire. An excited vascular action is there, and must in the first instance be subdued by suitable means ; and then, but not till then, cauterization may be expected to induce the most favorable results. Even then it may still be employed with undue severity, again lighting up the action which had just been extinguished ; and therefore the first application should be especially cautious. Should over action, notwithstanding due precaution, result, the soothing treatment is once more to be had recourse to, instead of blindly persevering with the cauterization. In order to subdue the excited action, whether casual or the result of malapraxis, M. Lisfranc unhesitatingly advises general bleeding. We begin to suspect that he is much too fond of this (almost as bad as his countryman, M. Bouillaud, vide our No. XXVI, p. 405) ; and would rather content ourselves with local bloodletting by punctures or leeches; agreeing, however, very fully with our author in the propriety of placing the latter at some distance from the actual disease, otherwise there is much probability of the wounds degenerating. The general bleeding he employs is revulsive, not spoliative ; practised as far as possible from the seat of the disorder, not exceeding three or four ounces in amount, and sometimes repeated pretty frequently. 3. As to repetition of the cauterization, M. Lisfranc justly censures the custom of defining such matters by a fixed period. " Let it be repeated every eight days," say some, with surprising exactitude. This may be all very well with a shower-bath, a purge, or a diaphoretic, but is not so suitable to the cautery, actual or potential. We must watch effects, and be guided by circumstances. If after the first application, the sore cleans and then advances favorably by healthy granulation, why repeat the cauterization at all? unless indeed you wish to excite thus artificially a disease similar to, if not worse, than nature's product, which just before you had been in the way of curing, but which you now seem wishful to reinduce. And on the other hand, when the sore, at first a little amended, rapidly reverts to its former perverted condition, why wait for the expiry of any definite period? Attack it immediately. 4. Before applying the liquid, the ulcerated surface is to be carefully wiped and dried, otherwise the fluids of the sore combine rapidly with the caustic, forming a white

coating under which the diseased surface lies intact.   5. The part is
touched lightly with the caustic; the object is not to disorganize it
wholly, but rather to change its action in some mysterious way, designated
by M. Lisfranc " a modification of the vitality of the tissues;" the term
" cauterization" therefore is rather a misnomer here.   6. When the dis-
eased surface is extensive, it ought not to be all touched at once, but by
instalments; and often the distant parts are, as if by the example of the
others, brought into a better mode of action before their own turn for
being touched has arrived; thus saving both time and pain in the cure.
7. Such is our author's local treatment. In our own experience, we can
speak favorably of both the " liquid protonitrate of mercury" and of the
plain nitric acid; the principal fault of the former is the long persistence
of severe pain after its application; but we have long since come to the
conclusion that fully as much is to be done by internal or constitutional
treatment, as by remedies directed to the part alone.   Arsenic, iodine,
hydriodate of potass, sarsaparilla, and in some very rare cases mercurial
preparations, are valuable, each in its own place and way, after rectifi-
cation of the primæ viæ, as well and as fully as lies in our power.   In
general, M. Lisfranc believes that excitant remedies are much too indis-
criminately employed, not only to the retardation of the cure, but often
to the aggravation of the malady.   From this he would carry us back to
his favorite system of revulsive general bleedings; the principle is good,
the practice so-so.

In a short chapter, M. Lisfranc well insists on the important difference
between *congestion* and *inflammation*, both as to their nature and treat
ment.   Some people have a constant vision of inflammation before them,
are haunted by it, and become perfect Sangrados in practice, to the sad
detriment of their patients, themselves, and their profession.   But this
subject is surely by this time sufficiently distinct in our own medical
literature, and requires no illustration here.   In the same chapter M.
Lisfranc justly reprobates the protracted use of poultices in wounds which
have been inflamed.   So long as inflammation actually exists, they are
useful towards its subsidence, if not heavy or rancid; but after a time
the wound becomes stationary, is somewhat painful, has lips swollen and
red, emits a profusion of purulent secretion, and makes no progress to-
wards reparation.   Omit the poultice, employ a simple detergent and
protective application, and a rapid amendment will immediately ensue.
The poultice was here to blame; but not by its " relaxing" effects, as
usually stated.   We believe that it induces and maintains a *congestion*
in the part, on which congestion all the above symptoms and appearances
depend; and to remove that congestion all that is necessary is to remove
its cause—the poultice. Poulticing of the chest is a favorite remedy
with some for inflammatory affections of the interior; its modus operandi
is by obtaining sanguineous flow to the surface; and this seems a key
whereby we may explain its unfavorable effect when too long used as a
direct application to wounds.   And, by the bye, this is another example
of the superiority of water dressing over the poultice as a vulnerary, as
formerly stated; the former having all the good qualities of the latter,
and being less likely to injure by negligent or empirical use.

On hernia. In regard to the treatment of this most important disease,
there seems to be two strongly adverse opinions at present dividing the

surgical world. The one, that when strangulation has been fairly esta-
blished, we cannot operate too soon ; the other, that the operation is to
be long deferred ; or rather that by the taxis and subsidiary means, judi-
ciously and patiently persevered in, operative interference will in most
cases be rendered wholly unnecessary. Here we find the old adage coming
true once more, " in medio tutissimus."· And the sensible man will not
attach himself to either extreme, be it *gauche* or *droit*, but wisely steer a
middle and a natural course : being satisfied by sober experience, that
urgent cases will not unfrequently present themselves, in which the
knife's edge must not be withheld for one half hour ; while others, and
perhaps they may constitute the majority, not only warrant but call for
delay in operating, and may eventually yield, in all safety, to the taxis.
M. Lisfranc's opinion on this subject seems scarcely to occupy the *juste
milieu* which we have endeavoured to indicate, but rather inclines to the
non-operating extreme, nearly to the same extent as his countryman
Malgaigne. We are also aware that in this country, a living surgeon of
some local celebrity has long boasted that he has as yet met with no
hernial protrusion, strangulated, incarcerated, or free, which has been
able to resist the stern and rude compulsion of his finger's gripe. But
we have not yet learnt how many cases of death by gangrene and fecal
effusion have occurred in this gentleman's practice. It would require a
power of eloquence even more persuasive than that of his manual organs
to convince us that such dire casualties have been either " few or far
between." We shall briefly advert to the more interesting and important
of M. Lisfranc's observations on this subject. 1. Two questions are
asked : In strangulated hernia, are a great number cured who have been
operated on immediately? Are many strangulated herniæ simply re-
duced without untoward results ? M. Lisfranc seems to think that to
both we cannot reply, Yes ; but we differ from him in this, and believe
the true answer to be in both affirmative : at all events, we see no reason
why this should not be. Statistics afforded by M. Malgaigne are ad-
duced to show that a negative is the due response to the former of the
interrogatories ; but these statistics, at least, as quoted by our author,
are glaringly incomplete, and therefore totally irrelevant to the point at
issue. The mere naked statement that out of 183 operations there re-
sulted 114 deaths does not militate against the operation itself, unless
it be at the same time shown, as is not attempted, that these cases were
operated on at an early period, and otherwise under favorable circum-
stances. Nor because we are merely told that, between the ages of
fifty and eighty, ninety-seven operations produced seventy deaths, are we
to believe that therefore Boyer was wrong in saying that in old people
the performance of the operation ought to be especially early. In these
fatal cases, was the operation timeously and well done, or only at the
eleventh hour, and with the rashness of despair ? If the former, then
Boyer was wrong ; but if the latter, his doctrine is still unshaken ; and
before our opinion can be made up on such data, the preceding interro-
gatories must be plainly and fully answered. 2. M. Lisfranc comes
closer to the point when he tells us that he has himself operated, and
seen others operate " in a great number" (his footrule exactitude would
be of use here) of cases, where " inflammatory strangulation had existed
only for some hours,"—and yet the operation seemed to be very mur-

derous. Such is his experience; that of others differs. Besides, though
we must award to his operations the meed of dexterous performance, yet
it is not shown that they were even in these cases timeously had recourse
to. For every practical surgeon knows that an " *inflammatory* strangu-
lation" may in less time than is occupied by " some hours" render all
hope from any operation, however skilfully executed, wholly abortive.
On behalf of the accused operation, then, we beg to plead "not proven."
3. We are told that Jean Louis Petit met with little success, but sad re-
verses, in his operations on non-strangulated herniæ with the view of ob-
taining a radical cure. Jean Louis Petit deserved no better fate in such
a shameful business. Operations of "complaisance," and these were
scarcely so good, seldom have a prosperous issue. Because a man has
his toe amputated, on account of a corn, in order to improve the look of
his boot, and has both limb and life endangered by a subsequent ery-
sipelas, that is no reason why a similar operation should not be performed
when the said member has been crushed to a jelly by accident. And
though amputation of an anchylosed knee, on the score of mere defor-
mity, has not unfrequently had a fatal issue, is this to debar us from
performing a precisely similar operation on account of hopeless disease of
the articulation? We trow not. 4. M. Lisfranc has " performed the
taxis in many cases with perfect success." So has every experienced sur-
geon; and what is more, so does every experienced surgeon expect to do
again. But such facts by no means liberate him from the fear, that not
a few cases may occur, in which he must desist from the taxis, even at an
early period, and take up his bistoury. " There is a time for everything,"
a truth which practical surgery teaches to many with less quickness of
apprehension than a Solomon. 5. It is usually held that abortive at-
tempts at reduction, when long continued, aggravate the disease. M.
Lisfranc denies this, when the operation is immediately performed on ces-
sation of such attempts. He forgets that the cause of inflammation in an
important texture, whose power to control increased and perverted action
is impaired, has been for some time in active operation; and that the
mere cessation of that untoward exciting agency may not be sufficient to
extinguish the action already kindled, and prevent its progress to a dele-
terious issue. Surely there is no sounder maxim in surgery than that in
those cases in which a prima facie suspicion is given of a necessity for
operation being about to occur, forcible manipulation ought not to be
employed for any lengthened period; and, more especially when the
strangulation is already of the inflammatory character, otherwise the
prospects of the case must be clouded darkly indeed. 6. Moreover,
M. Lisfranc makes light of the chance of returning a gangrenous intes-
tine by heroic taxis; congratulating himself that there are so few such
accidents on record. But ought there to be any? And are not such
cases, however few, proof demonstrative to what fearful disasters the taxis
may lead, when blindly and brutally persevered with? He contends
that taxis is the rule, and operation the exception. We admit this; but
at the same time are fully convinced that *many* exceptions must ever
occur to the general rule. We by no means undervalue taxis, but be-
lieve that like every other good thing, it not only may be but is frequently
abused; to be successful, indeed not to be injurious, it must not only
be well timed, but judiciously and carefully conducted. 7. M. Lisfranc

admits that there are cases in which the taxis is not to be attempted. When the symptoms of strangulation are followed suddenly by a perfect calm, deceitful to the patient and his friends, most alarming to the surgeon; the intestine is already gangrenous, and if now reduced, loss of life must follow. It requires no witchcraft to tell that in such cases the taxis is inexpedient. But we hold that the period at which the taxis has ceased to be hopeful of benefit is much earlier. When the inflammation is marked and progressive, and the tumour tense, tender, and unyielding, the pulse abdominal, and the system plainly getting worsted in the struggle, then it may be hours before M. Lisfranc's advanced class of symptoms have come on, then is the time to cease manipulation and haste to operate, with the double hope of safety of life both to the patient and to the important texture involved in the disease. 8. Further, it is admitted by our author, that there are certain cases, " happily rare," in which an insidious inflammation is slowly advancing to gangrene, and yet without any adequate manifestation of such a mischief; and in which an indiscriminate taxis would doubtless be prone to return an intestine either sphacelated or about to be so. Two such accidents happened to M. Lisfranc himself; and therefore he comes round so far as to admit that after the fourth day of strangulation the taxis ought not to be attempted, (ought a fourth day of strangulation ever to arrive?) And he also announces that when a narrow-necked hernial tumour is tense, with an evidently grave inflammation raging in the strangulated parts, the taxis is not only useless but highly dangerous, and therefore not to be attempted. 9. In regard to artificial anus, M. Lisfranc agrees with M. Dupuytren in the propriety of delay in the use of the enterotome; because the aperture may heal either spontaneously or by the influence of pressure alone; and because premature application of the instrument may rupture recent adhesions, producing an acute inflammation which may seize on the peritoneum, and end fatally. M. Velpeau applied the enterotome on the sixteenth day; death resulted; and M. Lisfranc does not fail to tell him of his mistake. But we must vindicate M. Velpeau's opinions on this topic, at all events as held " at the present writing." In our Twenty-fourth Number, p. 460, he will be found detailing the dangers attending the unguarded use of the instrument—peritonitis; fecal extravasation by ulceration, or by premature breaking up of limited adhesion, and no formation of compensating deposit; also inclusion of a portion of sound bone in the embrace of the blades. 10. In applying the taxis, M. Lisfranc agrees with the majority of surgeons in this country in the propriety of ascertaining the exact line of the hernial neck, and transmitting the reducing power in that direction. 11. There seems little doubt but local bloodletting ought to be more frequently and fully practised in inflamed and strangulated hernia, more especially if the inflammation have preceded the strangulation, and otherwise may reasonably be considered its cause; but M. Lisfranc justly reprobates the direct application of leeches to the tumour itself: sensibility of the skin is increased; the taxis becomes more painful, the patient more unsteady; the blood makes the surface slippery, rendering the manipulation both difficult and ineffective; ecchymosis masks the subintegumental textures, and complicates incisions when ultimately had recourse to. The leeches will be equally effectual if applied in the *neighbourhood* of the tumour. 12. M. Lisfranc

disapproves of relaxation of the abdominal parietes during attempts at reduction.   He believes that when relaxed, they apply themselves to the contained viscera, diminishing the abdominal cavity, and intimating that there is no room for the excluded portion; that they are apt to yield too much to the taxis, sliding under the fingers; that as tense parietes favour passage of the abdominal contents, in one direction, they will also do so in the opposite; and as relaxation of them is unfavorable to protrusion, it will be equally so to reduction; the fist is easily pushed through a hole in a towel or blanket which is stretched, while one that is loose may foil many efforts.   By such reasoning as the above, M. Lisfranc is led to recommend moderate tension of the abdominal parietes during the application of the taxis.   We are not prepared to coincide with him, especially in the justness of his similitude regarding the hole in the blanket; but see no reason why, failing in reduction during abdominal relaxation, we may not make new attempts during moderate tension.   In crural hernia, it seems very plain that much benefit is to be invariably expected from simultaneous relaxation of both thigh and abdomen.   13. In determining the direction of the reducing power, M. Lisfranc again pulls out his footrule, and wishes to fix us down to certain invariable centimetres and millimetres.   Here we are wholly in favour of "a sliding scale," knowing well, that according to the age, size, and other circumstances of a hernia, the form and direction of the abdominal apertures and canals must frequently change; and that therefore such fixed measurements are more likely to be fraught with error than with benefit, especially in the hands of the inexperienced surgeon, for whom they seem chiefly intended. 14. Tobacco enemata are held by M. Lisfranc to be extremely dangerous in this disease, and not expedient as auxiliary to the taxis.   Agreed. 15. In employing the taxis, in favorable cases, M. Lisfranc enjoins steadiness and perseverance in the efforts, taking a hint on this subject from nature's means of pushing the child's head along the vagina.   Again we concur, but under the limitations formerly specified.   16. As to the use of purgatives after reduction, M. Lisfranc coincides with the general opinion as to their evil tendencies when inflammation exists; but seems inclined to recommend them otherwise.   To this we demur.   It has been satisfactorily shown by Travers and others, that a temporary paralysis of the constricted bowel occurs in most cases, when the strangulation has been severe, and persists for some considerable time after reduction. Purgatives during this condition must be highly dangerous, stimulating a part which has not yet recovered the power of obeying that stimulus; and is most likely, besides, to induce an excited vascular action, where there is little power to control it; and when, therefore, gangrene is more than probable.   For "purgatives" read "laxatives" in the treatment of recently reduced herniæ.   17. When inflammatory symptoms follow reduction, M. Lisfranc considers the external application of mercurial ointment to be highly efficacious, according to the formula of M. Serres d'Uzés.   Two pounds of the ointment are used in the course of forty-eight hours, spread on the lateral and anterior parts of the abdomen, laid on layer by layer every two hours, until the whole dose is expended.   If two days' use of this, according to M. Serres, prove insufficient, the method is to be abandoned in favour of others.   But M. Lisfranc has a higher opinion of it, and states that he has used it successfully, to the extent of ten pounds in five days, and sixteen pounds in eight days!

We are rather disposed to think this a clumsy method of exhibiting mercury, and would rather undertake to *pound* the peritonitis by its internal administration, leaving the abdominal surface free to be more usefully and energetically handled by depletion or counter-irritation, according to circumstances. 18. Cold is not in favour with M. Lisfranc as an auxiliary to the taxis. We agree with him that intense and continued cold, as by ice, is most dangerous in urgent inflamed strangulation, and is more likely to promote sphacelus than reduction. But in the more chronic yet equally obstinate cases of strangulation, without marked inflammation of the extruded parts, we have seen the most obvious benefit from the use of cold by evaporation; nitrous æther, for example, applied to the tumour, and its evaporation promoted by sufflation. In two cases lately, one of inguinal, the other of crural, both very large, we had used the taxis as powerfully and as long as prudence seemed to warrant, yet without making the slighest impression on the tumour. An interval occurred, during preparation for the operation, and that was occupied in the use of the evaporation, scarcely with the hope of benefit; yet after its brief employment, a very slight manipulation, in one case by the patient himself, sufficed for satisfactory reduction. We are not prepared to explain fully the modus operandi of this remedy, but believe that it chiefly acts by condensing the gaseous contents of the bowel, thereby effectually diminishing the tension and bulk of the tumour. At all events, in whatever way it acts, we are fully convinced by experience, (and, as M. Lisfranc often tells us, " there is no resisting the brutality of facts,") that it is in many cases a most powerful auxiliary to the taxis; and should be sorry to operate on an uninflamed strangulation without having tried its previous employment. In an inflamed hernia, its use must be highly prejudicial for very obvious reasons. 19. Sundry examples are given of varieties in the site of stricture. A case by Lecat, for example, in which the bowel, after having perforated the anterior part of the sac and the posterior part of the tunica vaginalis, became strangulated by the margins of this unusual opening. The expediency is also well insisted on of inquiring carefully into the previous history of the case, to ascertain whether or not the tumour in its ordinary state had been wholly reducible; otherwise useless attempts at taxis may be hopelessly persevered in, or else a portion of reducible bowel left unreduced. 20. In crural hernia, we are not to suppose that the neck of the tumour is limited to the passage through the abdominal parietes; the canal of its transit extends to the fascial opening for the union of the femoral and saphena veins, over which it turns resting its fundus on the abdominal walls. M. Lisfranc rather ridicules the ordinary mode of undoing this turn of the tumour, bringing it into a line with its neck, before applying the taxis. But here we think he is wrong, and contravenes one of his own general principles formerly noticed. 21. The usual posture of the surgeon in reducing hernia is beneath the site of protrusion, pushing from him. M. Lisfranc's experience leads him to prefer an opposite mode of procedure, standing above and drawing the tumour towards him; but still he does not wish this to supersede the ordinary mode in every instance. Many important practical points relating to the treatment of hernia are not even touched on by M. Lisfranc; but we cannot be expected here to supply the deficiency.

If fistula can produce the indurations which surround them, often

such indurations are the means of maintaining the fistula. In treating an ulcer of the leg complicated with callosities, cicatrization is scarcely to be obtained without previously bringing the indurated tissues back to their normal texture; and it is the same with fistulæ. To reduce the indurations rest, leeching, pressure, and preparations of iodine are the means employed. Still the fistula may not heal; then injection is recommended, and for this purpose M. Lisfranc again brings forward his favorite chloride of soda, proportioned in strength to the exigencies of the case. Failing injection, pressure: failing all, incision. And always opposing " an obstinacy of treatment proportioned to that of the disease."

Wounds made in " tissus lardacés non squirrheux," and not arrived at the stage of softening, may be the means of restoring them to a healthy condition. This principle M. Lisfranc wishes to apply to the saving of limb and life in amputations; showing that in the leg, for example, we may amputate there on account of carious bone, though placing our incisions in diseased soft parts; and are not *compelled* to operate on the thigh. And in similar affections of the fingers or metacarpal bones, the valuable organ of prehension may oftentimes be comparatively little mutilated, by cutting in and not above the soft indurated parts. The loss of blood and the subsequent salutary amount of inflammation have the power of restoring these to a normal state; the amendment seeming to commence on the surface of the wound, and thence gradually to extend outward. In these circumstances, however, the flaps must be made unusually full, otherwise subsequent atrophy of them will leave but a sorry covering to the stump. And during the early period of treatment we must be especially careful to avoid an excess of inflammatory action, which in such textures would be certain to advance hastily to the most unfavorable results. At first the flaps are not approximated, but left free to suppurate and amend. When, however, the expected improvement has taken place—as evidenced by subsidence of swelling, diminution of discharge, and appearance of healthy granulation—then the surfaces are brought and retained in contact, with good prospect of rapid and satisfactory union.

On the same principle M. Lisfranc proposes to treat the indurations by which ulcers (indolent) are so frequently surrounded, by scarification, a method much extolled by Ambrose Paré, and which, our author complains, has most unjustly been permitted to fall into desuetude. We suspect, however, that the treatment by traction and pressure, as first proposed by Mr. Baynton, and since modified and improved by various practitioners in this country, will be found adequate to the accomplishment of the same indications at a less cost of time, pain, and risk. To make " forty or fifty scarifications" of an ulcerated limb " every eight or ten days" is scarcely consistent with the usual tenor of British surgery. But as M. Lisfranc does not enjoin such heroics " until other means have failed," we are happy to feel that we need not anticipate being often, if ever, compelled to employ them.

General rules regarding the disarticulations. In this chapter our author lays down precise rules for guidance in the manipulations, founding all on his favorite " échafaudage des linges." But into such elementary paths we are not expected to follow him—much to our relief, to say the truth; for the task would require the oft-repeated use not

only of the foot-rule and compasses, but of various philosophical imple-
ments necessary for ascertaining angles with mathematical exactitude.
This system, according to our author, has been most potent in quicken-
ing the march of surgery, " thanks to his firmness and courage ;" but
on this point we are disposed to be sadly sceptical, for reasons formerly
given in, and to which we wish to be understood as still adhering.

Of the simple atonic ulcer. Under the denomination of " atonic"
M. Lisfranc plainly includes the " weak" and " indolent" ulcers of other
classifications. A few of his opinions on this subject require notice.
1. He supposes that it is not mere atony or debility that induces such
morbid formations so frequently in the lower extremities, else they should
be oftener on the toes and foot than on the leg. Retardation and
obstruction of the venous circulation is obviously more intimately con-
nected with their origin. In the case of varicose ulcer, every one admits
the varix to be the principal cause of the breach of continuity ; to the
simple ulcer M. Lisfranc wishes to allocate a similar though less marked
connexion, as to origin, with venous congestion. With this we wholly
agree. 2. But when shortly afterwards we find him stating that this
venous congestion operates thus ulceratively " by a gangrenous inflam-
mation, *sui generis*," we find fault with his terms, and differ with him
in toto. The venous congestion predisposes to inflammation ; a slight
exciting cause suffices to kindle the flame ; by the venous congestion
the healthy functions of the part have previously been materially inter-
fered with, and its *powers* consequently impaired ; it controls the excited
action badly, if at all, and falls before it an easy victim, by the disinte-
grating process of ulceration. At first the ulcer is an inflamed one ;
but by and bye such characters leave it, and it *ought* to become a sim-
ple, healthy, purulent sore, evincing the justice of its claim to this
honorable appellation, by pushing forward healthy granulations, and
showing an evident wish to cicatrize laudably. But the cause which
rendered the attempts to control the inflammation abortive is still in
operation, rendering equally nugatory all efforts at reparation ; and
thus the sore very soon dwindles down into the " atonic" ulcer. And
thus, by the ordinary causes of disease is the sore produced ; not by
inflammation, "gangrenous" or "sui generis." Such terms thus em-
ployed are loose, meaningless, at variance with sound surgical patho-
logy, and obviously tend to foster empiricism—a leprous excrescence on
our art which M. Lisfranc is in general the loudest to condemn. Ulcers
of the lower limbs are often admitted into hospitals in a sloughing or
gangrenous condition ; but that is a casualty easily accounted for : action
beyond power ; and moreover such an ulcer is not then to be termed
" atonic," but inflamed. 3. Is M. Lisfranc, quoting from M. Gensoul,
in earnest when he contemplates ligature of the femoral artery as a cure
for ulcer of the leg? We hope not. Did it succeed, it might doubtless
be a point in favour of his view of the origin of the malady ; but in the
case of failure we fear that, in this country at least, the legal code of
the realm would come to the assistance of the offended laws of humanity.
4. The reasons why ulcers are situated more frequently on the left
lower extremity than on the right, are well stated. The sigmoid flexure
of the colon, often full, passes over the left external iliac vein, while on
the right side this vessel is free. The left iliac vein is covered by the two

common iliac arteries; again the right is comparatively free. These arteries interfere with the venous current not only by virtue of their mere weight, but also by virtue of the column in them being more impetuous and powerful than the counterflow in the vein.   5. That either leg should be the frequent seat of ulceration, preceded and induced by venous congestion, is readily understood by reflection on the fact, first shown by M. Serres, that the saphena vein is unprovided with valves, from the inner ankle to the lower part of the calf.   In many subjects, from the knee to the foot there are no valves at all in that vein; and when present there are seldom more than two—one at the lower part of the calf, the other near the inner condyle of the tibia.   6. In the treatment of weak ulcers of the lower limbs, so far as we are aware, due prominence is awarded by all good surgeons to the indication of obviating as much as possible the venous remora, by bandaging, attention to position, confinement to the recumbent posture, &c.   But M. Lisfranc is heroic on this topic, and attacks the evil more boldly.   By operative interference he obtains, or wishes to obtain, obliteration of all the superficial veins in fault, driving the current to a deeper channel; performing, in fact, the operation which others only deem warrantable in the most troublesome and obstinate cases of varix.   The theory on which this mode of treatment is founded is faultless; but possessing as we do a most cowardly yet salutary dread of phlebitis, and believing such interference with veins to come nearly, if not wholly, under the denomination of the " opérations de complaisance"—the unfortunate results of which are proverbial—we must be excused from either following or sanctioning the practice, until guaranteed by further experience that disaster is not likely to outweigh the anticipated benefit.   5. M. Lisfranc admits that phlebitis is by no means an unlikely result of his practice, but congratulates himself that *as yet* he has lost no patient from this cause.   The principal means in which he trusts for its subjugation is the application of leeches between the inflamed point and the heart; a very good principle, breaking the stream of flame, as firemen in desperate cases direct their aqueous shower, not on the doomed building, but on its neighbour as yet intact.   6. M. Lisfranc speaks of the varicose ulcer as a distinct species.   Are not all kinds of ulcer found complicated with varicose veins in the same locality ?   7. From the " varicose ulcer" he has known fatal hemorrhage occur; and in the dissection of such cases he has found the saphena much thickened in its coats, and presenting an open section like that of an artery, an inert tube through which the blood flowed freely and uncontrolled.   8. Absorption is more sluggish in an ulcer than in a recently-exposed surface; on the former morphia may be inert, whilst on a blistered part much activity of operation is to be expected.   On the extreme surface of the ulcer is a new formation not yet fully endowed with all vital properties, and absorption, amongst the rest, is deficient.   On this account the calamitous reabsorption of pus by casualty or improper treatment is less likely to occur in the case of an old ulcer than in recent suppurating wounds.   9. On the practical question as to the expediency of drying up and healing old sores, we have the following sensible remark : " Examine the state of the viscera, especially in the chest and abdomen; if they are sound, if the general health and system seem good, if the ulcer in its formation have

not dispersed another and more important disease, cicatrization is to be attempted," and "vice versâ;" in extreme cases never omitting the precaution of establishing an issue conveniently in the vicinity, as an atonement for the ulcerous discharge to which the system has been long accustomed. Should evil nevertheless threaten, the original sore ought doubtless to be reestablished with all convenient speed. 10. When a sore proves sluggish in healing M. Lisfranc "immediately has recourse to stimulants." We dislike the phrase "sur le champ" here; for sudden change from bland to stimulating, in the applications to sores, is one of the worst errors in every-day surgery; the transition ought uniformly to be gradual, unless in the sloughing or phagedenic, when indeed arrestive measures must be prompt as well as powerful. 11. Ointments are held by M. Lisfranc to be "often of great utility." In this country the lotions have nearly exterminated the unguents, and, we think, most righteously. 12. We believe that healthy pus is not only bland in its nature, but that it is secreted on a granulating surface for the express purpose of protecting the tender granulations from atmospheric influence and other sources of injury, until they are finally covered in and protected by the new cuticular membrane. And we consequently hold the wiping, sponging, and washing of sores, especially when oft repeated, to be vile, meddlesome, mischievous surgery. M. Lisfranc espouses an opposite doctrine, and falls into the old mistake of supposing that the *pressure* of confined and accumulating pus, producing serious mischief in hard and soft tissues with which it is in contact, is proof positive of an *eating* and *acrid* propensity in the fluid itself. Frequent dressing and careful removal of pus constitute his rule; the opposite the exception. And the more irritable the sore, the more diligent is he in wiping away the pus suspected of tending to increase the irritation. Wanted the means of converting a sound, healthy sore into either an irritable or an inflamed one, M. Lisfranc has solved the problem—unwittingly. There are extremes in all things; and we grant that dressings allowed to remain for days unchanged will, by putrefaction, render the puriform fluid most plainly irritant to the surface with which it is in contact, and, moreover, further noxious to the patient and his neighbours, by tainting and deteriorating the atmosphere; indeed, we think we have seen the occurrence of hospital sore attributable to this cause; but, as a general rule, the less a healing sore is interfered with the better; and certainly when it is dressed, merely the superabundant pus should be wiped away, not from the sore itself, but from its vicinity. M. Lisfranc labours to support his opinion by argument, but fails signally; in one point he palpably contradicts himself: in atonic ulcers he thinks it a good plan to dress the sores seldom, that they may have the full benefit of the rancorous tendencies of their own secreted pus; and in the very next sentence he advises us, "when the vital properties (of the sore) languish, (to) wipe the denuded surface scrupulously." (p. 527.) But on this subject we need not dwell; satisfied that the influence of M. Lisfranc will not be sufficient to break up the juster notions now held regarding the dressing of sores in this country. 13. In obstinate, indolent ulcers we are again recommended to attack the surrounding callosities by incisions. We cannot help thinking that most people, especially out of the profession, will be reminded by this of the old adage bearing

on the impolicy of manufacturing ten holes in the attempt to tinker one, and will prefer, along with us, the treatment by traction, pressure, and stimulation ; the more especially as in the next page (529) we are told by M. Lisfranc that it is quite possible such incisions " may occasion purulent reabsorption, and compromise the patient's life." 14. Some sores of the atonic class resist even M. Lisfranc. By two elliptical incisions they are dissected out, " as if a tumour ;" and " thus a very rebellious ulcer is converted into a recent wound, which heals readily." We have not yet encountered an ulcer of any of the simple classes warranting such a summary ablation ; it is possible a more inveterate species is to be found in Paris. 15. The solution of the chloride of soda is extolled as a stimulant application to sores, and, we doubt not, with perfect justice. The best of such lotions, however, will fail after a time, and it is only by a judicious alternation that a continuously favorable condition is to be maintained. 16. For repressing exuberant granulations M. Lisfranc seems to employ cauterizing substances alone. Dry pressure by compresses of lint, judiciously applied and retained, are, in our opinion, equally effectual, and less likely by accident to prove injurious. 17. In dull, obstinate, sores, whose surface has assumed a mucous character, the " liquid protonitrate of mercury" is recommended ; this remedy is coming into use in this country, and, we doubt not, will be found available in effecting a " change of action" in many sores. As an enemy of phagedæna we have already attested its prowess. 18. It is often no easy task to heal a sore ; and yet a more difficult one remains to keep it whole. Uniform support is a principal means towards this desirable end, and is usually effected by means of a laced stocking, which ought not to be *uniformly tight*, strictly speaking, but slacker above than below, in order to favour the venous return ; the preferable texture for its construction is dogskin, according to our author ; the upper part may be made of caoutchouc ; and, to prevent its slippping, it may be attached to the drawers. If the patient's circumstances permit, obviously he ought to keep the limb at rest for some considerable time after cicatrization ; it being well understood that the new textures are at first feeble and imperfectly organized ; yet each day adds to their power and organization. 19. M. Lisfranc enters on a review of the various modes whereby veins may be obliterated ; holding that, " if an ulcer have resisted all therapeutic means, if, in other words, it is impossible to heal it, if it condemns the patient to absolute repose, if it place his life in danger, if it renders amputation necessary, the vein ought to be attacked." Not, however, in old people of unsound viscera, not when the veins are already in a state of excitement, and not upon a dilated or varicose point of the vessel. A healthy part above the collateral veins is the point of election. Subcutaneous section, according to the method of M. Guerin, is favorably considered by our author ; but his experience on this matter is as yet but limited ; he has performed the operation once, and with success. Formerly he was in the habit of cutting out two inches of the vein—rather a clumsy operation, as M. Velpeau told him ; and from this gentleman's charge to that effect he is scarcely extricated by a bitter reclamation (p. 544 et seq.) And here we would take the liberty of hinting to our author, in a friendly way, that M. Velpeau is not so bad a surgeon as M. Lisfranc—takes him to be. On the whole, the proceedings most favorable for obtaining obliteration of the veins are,

(1) those of Messrs. Franc and Ricord; (2) the subcutaneous section; and (3) resection of the vein, by his own operation just alluded to. In this country practitioners have almost unanimously selected No. 1; the twisted suture placed beneath the vein, and retained for a period varying according to circumstances; and as yet, so far as we are aware, they have had no reason to repent them of their choice. 20. M. Lisfranc does not admit ever having caused death by operations on veins, but his patients have died " from other causes," and he has dissected them. He has found the saphena obliterated, resembling the umbilical vein in the adult, from the point of operation down to the big toe; the collateral branches participated largely in the same condition: no traces of the varices remained, and obviously the circulation had been chiefly carried on by the deep venous system. Hence he infers that relapse after such operations is extremely improbable. We wish he were right.

On white swellings of the joints. This is the longest chapter in the book, and the least satisfactory. At the outset, we quarrel with the term " white swelling." It has been for some time dismissed in disgrace from the pathological vocabulary of British surgery, as vague, unmeaning, unscientific, and pregnant with tendencies to practical error, or at all events to blind empiricism. At one time, with us, everything in the shape of disease affecting the joint was dubbed " white swelling," and forthwith treated according to that name merely, not according to symptoms and circumstances. From such a misfortune we have been delivered: but M. Lisfranc, unfortunately, is still in the thrall of bondage. His *improved* definition of the term adopted from a M. E. Margot, would really warrant a treatise " de rebus omnibus (concerning joints) et quibusdam aliis." But bad as is the beginning, and commonplace and elementary as is the major part of the chapter, yet we shall find certain portions by no means barren of interest. 1. One word more as to the odious term. In order to show that he is not in the error of supposing all " white swellings" to be non-inflammatory, he proposes to divide them into " white swellings" and " red swellings." This is a little better; and as an omen of further and more healthy improvement, we are thankful for it. " Black spirits and white, red spirits and gray," are better than all white; but there is still too much of the " mingle, mingle, mingle." 2. Among some operating surgeons in busy practice, there is to be found a degree of recklessness as to amputation of diseased joints; looking too intently to the local disease alone, and not taking into consideration the fitness and working of the rest of the system. On this point our author is most sound, exhorting us as often as we are consulted in a case of " white swelling" to examine with scrupulous attention the state of the abdominal and thoracic viscera. If they are diseased, the joint affection may be an effort of nature for their relief, and must not be rashly interfered with. As it cures they may deteriorate; they are at first to be amended, if possible. And before operating in such cases, especially when suspicion of tubercular cachexy is urgent, a prognosis not based on a careful and accurate examination of the internal organs is worse than valueless. Chirurgery is not applicable here: in medico-chirurgery alone is there safety. 3. We are glad to find M. Lisfranc decided as to the paramount importance of *rest* in the treatment of joint affections. We honestly believe that it is in consequence of better means and more honest endeavours to obtain this indication, that

the joint-mending of the present time is so strikingly superior to all that is foregone. We are very confident that no one not impressed with this idea will ever meet with credit or success in the practice of this department of his profession. And we are rather inclined to think that even M. Lisfranc, admitting the principle for which we contend, allows too many and too great deviations from it in his practical inferences; especially in regard to those of his "swellings" which are, par excellence, "white." 4. Abscesses formed *around* the "white swelling" we are advised to open as early as possible, for fear of evil consequences by delay. But abscesses *in* the "white swellings" are considered by M. Lisfranc as highly useful and commendable formations; and he accordingly enjoins us to open them as late as possible—the *devouring* pus, by remaining in contact with the "indurations," proving a most powerful discutient. (p. 582.) This runs counter to all our notions of sound surgery. Had we merely superficial "indurations" in the neighbourhood of common textures which could easily enough be spared, we should not grumble. But the destructive element is in juxta-position with one of the most important structures of the frame, and may at any time and with little or no warning leave its legitimate repast—the common textures—and prey fatally on that which we are most anxious to save. Out of his own mouth do we convict our author of error here. For in the very next page a case is related of fatal suppuration of the knee-joint, the occurrence of which any one but M. Lisfranc would have little hesitation in attributing to important delay in the opening of an abscess in the neighbourhood. 5. Leeches, applied to the number of three, four, six, and even eight, and the bleeding permitted for about a quarter of an hour after their separation, are held by M. Lisfranc to be stimulating, by determining blood to the part leeched, on the principle formerly explained. This is important, and ought never to be forgotten in practice. If the local depletion be intended to be spoliative and, consequently, sedative, it must be in greater quantity. M. Lisfranc supposes the minute leeching to be useful, as first excitant and then absorbent in the non-inflammatory swellings, and employs it accordingly. Repetition, however, he admits, is not unlikely to induce an erysipelas. 6. Compression has long been deservedly a favorite means of treatment in the chronic and indolent affections of the articulations; retarding the influx of arterial blood into the affected part, and thereby opposing perverted nutrition, stimulating its power of absorption, and effectually obtaining the precious immobility. But by indiscriminate use this is liable to abuse; and M. Lisfranc justly asks, "If the use of opium, antimony, &c. be regulated by doses, why not *dose* pressure also?" One uniform amount and mode and duration of pressure is not to be enforced in all cases, but it ought to be regulated entirely by the peculiar circumstances, past, present, and future of each individual case. And, in general, the older, the harder, the more indolent and dull the swelling, the more energetic the form of pressure to be employed. M. Lisfranc divides the remedy into five degrees, varying from slight pressure by means of diachylon, to active pommelling with the fists. But we rather think common sense will be found quite adequate to its due regulation, without the aid of such companions of his "échafaudage de lignes."* 7. O'Beirne's

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* A most important improvement in the mode of applying pressure to diseased parts has been recently made by Dr. Arnott. In this plan, pressure is applied on the *hydro-*

mode of treating diseased joints by calomel and opium to salivation is
alluded to, and censured as too indiscriminately employed. We agree
fully on this point; and have no hesitation in stating our firm belief that,
while Dr. O'Beirne has done much good service to his profession and
humanity by introducing this remedy, as one of the most valuable means
whereby to arrest *acute* affections of joints, he has almost, if not
wholly, neutralized this benefit by pushing it too far; extending its use
to chronic affections even of an obviously scrofulous nature, in which
amendment, if it occur at all thus, can only be purchased—blindly pur-
chased—at the cost of future misery and destruction. It is the way with
almost all new remedies. The unwise zeal of their happy and fond and
doating parents carries them too fast and too far; disappointment, doubt,
distrust, vacillation result; and some time is required ere the panacea,
tumbled from the high perch where it ought never to have been, can
settle down into its just and proper place. 8. As a local discutient,
M. Lisfranc prefers the iodide of lead to the hydriodate of potash, the
latter being apt to create an unnecessary disturbance on the surface;
and, in regard to the use of all such applications, he wisely recommends
caution, lest they overdo their work and bring on inflammation into all
the diseased structure. As an internal remedy, the hydriodate of potass
receives its due meed of commendation. 9. Another good general rule
is enforced connected with the counter-irritation: never to place the
cautery, moxa, seton, &c. too near the diseased part, not on the swel-
ling, but in its immediate vicinity, and never to employ such remedies
during the period of actual inflammation, otherwise the effect must be the
reverse of beneficial. 10. The muriate of barytes, as an antagonist of
everything scrofulous and of anything seeming to appertain thereunto, has
long fallen into disrepute in this country, failure and disappointment
having all but uniformly followed upon its use. M. Pirondi, of Marseilles,
thinks otherwise; and in M. Lisfranc it has found a most powerful ad-
vocate, and one who by no niggardly praise would wish to push it fore-
most in the list of means wherewith to attack the formidable *omnium
gatherum* which is designated by him " white swelling." The dose is a
gradual ascension from gr. vi. to ʒij, with a non-stimulant vegetable sys-
tem of diet, and with a guarantee as to the non-occurrence of debility
therefrom: on the contrary. It is admitted, however, that symptoms of
poisoning sometimes threaten; and to arrest these, the white of an egg
is said to act as by enchantment. In support of his opinion, a conside-
rable number of cases are brought forward; but we need scarcely say
that the evidence therein contained, to establish the efficacy of this me-
dicine, is by no means satisfactory. *Besides* the barytes, we read of
pressure, counter-irritation, hydriodate of potass, mercury outside and
in, leeches, rest, &c. in the treatment; and surely these, aggregately, if
not singly, are at least as much entitled to the credit of the cure. On
this point our author again finds himself at loggerheads with M. Velpeau;
and, notwithstanding an eloquent statement on the other side, we are
inclined to take part with the latter, even at the risk of being told that
we have " not a single sound idea of therapeutics within our cranium."
A catalogue raisonné of the good effects of the muriate is given at p. 627
et seq., but we care not to transcribe them. 11. A recovered joint gets

static principle. Most extraordinary results have been already obtained from it in the
case of tumours of the mamma.—Ed.

back its functions but gradually; and it is folly, or worse, to expect sudden amendment in this particular. A useful practical rule is given on this subject. Pain induced by motion and exercise, and disappearing within half an hour after resumption of repose, does not necessarily indicate a necessity for continuance of undisturbed rest; but if the patient continue to suffer, rest and sedatives are still essential. 12. M. Lisfranc believes that there is no pathognomonic signs of true anchylosis having occurred, and therefore advises gradual and gentle attempts to restore normal motion and position to all stiff joints otherwise recovered from disease. The barbarous employment of brute force towards this end, as practised by M. Louvrier, is justly condemned; but on this subject we will not enter, being afraid lest our usual serenity of temper desert us on the occasion.

Some remarks on exostosis—not venereal. In the term exostosis M. Lisfranc seems to include all tumours or enlargements of bone; not limiting it, as most surgeons here do, to mere local hypertrophy or simple enlargement of that texture. 1. That enlargements of bone can and do occur without the assistance of either "vice or virus," is a statement the truth of which we most willingly attest. And we believe that if this were more generally felt and acted on, we should, by so escaping at least some cases of blind mercurialism, have fewer of the worst class of osseous enlargements, and fewer samples of a hopelessly riven and shattered frame. It is consistent with our own knowledge that there are still men in the profession who hold that all bony swellings are nodes, that all nodes are venereal, and that all venereal nodes are to be treated by mercury, and nothing but mercury. "Heaven mend their wits!" 2. A tumour of the soft parts resting on bone involves this texture in disease; and this disease may be either simple or similar in character and disposition to that of the originating growth. In the latter case the bone, or at all events, the implicated portion of it, is to be taken away along with the tumour; in the former it is left behind, at least in the first instance; a chance being afforded it of recovery to a sound condition, and of which chance it will usually be found to take a commendable advantage. The favorable or unfavorable condition can only be ascertained by most careful examination, both of the exposed bone and of the primitive tumour. In all cases of doubt we would haste to err on the safe side, by at once removing the implicated bone, being well aware that secondary formations of tumour, whether in the soft or hard tissues, are almost invariably worse than their predecessors. 3. Ordinary bruises of bone, by inducing a perverted nutrition in that texture, may lead to the most serious morbid products. M. Lisfranc complains that this undeniable truth is not sufficiently borne in mind in the usual treatment, immediate and secondary, of such accidents. Often the apparently simple bruise is neglected and forgotten, until the formidable caries, necrosis, or tumour has made an obvious demonstration.

And now, having overtaken all the points which appeared to us deserving of notice, whether for censure or for praise, we close the volume, with undiminished feelings of respect for its author, but with a caution to all intending readers to beware how they lend implicit faith to all the doctrines, and blindly follow all the precepts, even of this Coryphæus of his art.

<div align="center">Art. IV.</div>

*Notes on the United States of North America, during a Phrenological
    Visit in* 1838-9-40. By George Combe. Three Volumes.—*Edinb.*
    1842. 8vo, pp. 371, 400, 488.

Mr. Combe in the introduction to this work, when discussing the dif-
ficulties which beset any single observer who endeavours to describe a
great nation, says, with truth and acuteness, that each writer should be
regarded as a single witness in a vast and complicated cause, and to ar-
rive at truth, the reader must analyse and compare the various reports.
Each traveller has probably moved in a different sphere, and from original
difference of mind, of education, and of pursuits, has observed and been
interested in different objects. This view is particularly applicable to
Mr. Combe's own " Notes ;" and we gladly accept him as a witness :
for although he is not a medical man, yet his favorite pursuit has led him
to observe and to study the reciprocal influence of the body and the
mind, and the great causes which produce their healthy and diseased
conditions. Mr. Combe visited the United States, and resided sometime
in New England, for the purpose of spreading the knowledge of phreno-
logy by lectures. He was consequently thrown much into the company
of those who, with intellectual tastes, active, practical minds, and with
little leisure from the business of life (a numerous class in America), are
willing to increase their knowledge by listening to viva-voce communi-
cations. Mr. Combe appears not merely to have imparted his own
knowledge, but to have observed closely those who came to him for in-
formation, and in his " Notes" he has recorded his impressions of the
mental constitution of remarkable individuals, and of the different classes
of the community, clothed in phrenological language, as well as many
observations on manners, habits, ventilation, public institutions, prisons,
lunatic asylums, and other such topics connected with health and disease.
We shall analyse and extract such of these passages as most interest us,
as medical observers, passing wholly by the " Notes" on religion, edu-
cation, and politics, which form the great bulk of these volumes.

  1. *Notes on habits, climate, &c.* The dryness of the air of the United
States, when compared with our moister island climate, has often been
remarked, and the fact that the American women lose their bloom much
sooner, and the men become in appearance withered and old more speed-
ily than in this country, has been partly explained on this supposition.
Mr. Combe found the climate of New England much more stimulating
(so that wine was unnecessary), the air drier, and apparently more highly
charged with electricity. " The habitual state of the American people,
also, is one of much higher mental excitement than that of the inhabi-
tants of Britain." (Vol. i. p. 79.)

  Before the commencement of winter the weather generally is calm,
mild, and dry, the sun shining without clouds the whole day, and a
gentle haze pervading the whole sky from the stillness of the air. This
is called the Indian summer, and is said to be the most delicious season
of the year in the United States. (p. 159.)

  Mr. Combe was especially struck with the deficient ventilation in pub-

lic buildings and rooms in which meetings were held. He often strongly
called the attention of his audiences to the dependence of the mind on
the state of the brain ; to the dependence of the brain on the blood
which circulated through it ; and to the dependence of the blood on the
respiration and digestion, thus showing the " direct connexion between
pure and sound digestion and mental vigour." The rapid transition from
ill-ventilated rooms and churches, of a temperature from 70° to 80° (F.)
to the cold air, 5° or 10° below zero, must, Mr. Combe thinks, be a fruit-
ful cause of phthisis so prevalent in the United States. " I sat," says
Mr. Combe, " three hours in the gallery of the senate chamber to-day,
and afterwards experienced those debilitating, irritable, and unpleasant
sensations which are generated by imperfectly decarbonized blood." (p. 95.)

Mr. Combe is in accordance with other travellers as to the beauty of
the younger American ladies, but " their forms are fragile, and indicate
liability to premature decay." (p. 112.) He quotes Dr. Lindsay, of
Washington, who says that all Europeans who have visited the United
States agree that the women are inferior in vigour, strength, and robust-
ness to corresponding classes in Europe, and especially in Great Britain.
" The European woman has a much more florid and healthful complexion,
a much more vigorous person, and is capable of enduring much more fa-
tigue and exposure, and of performing much harder labour. The slender,
and delicate, and fragile form, the pale, sallow, and waxen complexion,
which are so common among us, are comparatively seldom seen abroad."
Dr. Lindsay instances the long walks which English ladies are in the
habit of taking as a proof of their superior vigour. A walk of ten miles
would be an event to be talked of for life by an American lady ! Dr.
Lindsay thinks that his countrywomen are not only less robust but more
liable to ill health, particularly from derangement of the digestive and
nervous system.

" They rarely," says Mr. Combe, " walk abroad for fresh air or exercise.
In general they live and sleep in ill-aired apartments. Their duties press
constantly on their minds, and they do not give sufficient effect to the maxim,
that cheerful amusement and variety of occupation are greatly conducive to
health. They do not properly regulate their diet; pies, pastry, and animal
food are consumed in quantities too abundant for a sedentary life; and baths
and ablutions are too rarely used." (Vol. ii. p. 127.)

Mr. Combe seems to have endeavoured to attract the attention of
ladies to the value of health, by showing them in his lectures the connexion
between beauty, in the proportions and forms of the whole of the body,
and health, recommending to the fair part of his auditory the study of
the human figure in statuary and in painting, as the ideal models of
perfect development; so that if the mother saw " the abdomen of her
child tending to become tumescent, the chest flat, and the head enlarged,
she would easily become aware that there was some deviation from the
laws of health." This excellent advice was well received in the room, but
he was attacked in a newspaper subsequently for offending " the national
sense of propriety." This reminds one of Swift's notion, that " a nice
man is a man of nasty ideas."

The injurious effects of swallowing the food too hastily is admitted to
be exemplified on a large scale among the Americans, owing to their ac-
tive business-like habits and industry. In New York, at one of the large

hotels, 150 persons crammed down their breakfast in fifteen minutes.
"You Europeans," said an American to Mr. Combe, "eat as if you ac-
tually enjoyed your food." "Assuredly we do," was the reply, "and
you Americans will never escape from dyspepsia and headaches until you
also seem to enjoy your meals." An excellent hint to all who suffer from
the same symptoms in this country. In private life in America the same
haste is practised; for all are engaged in active occupations: there is no
large idle class as in the older countries, and the few who are inde-
pendent of work seem to be in a false position.

"If a young man inherit a fortune and follow no profession, it generally
happens that in less than ten years he ruins his fortune in low pursuits. In a
few years more his health is equally reduced with his estate, and he is banished
from society. These young men are pitied, their fate is predicted, and the pro-
phecies are too generally realized. The few who form exceptions are men who
engage in literature or science as a pursuit." (Vol. ii. p. 231.)

II. *Notes on lunatic asylums, schools for the blind, prisons, &c.*
The lunatic asylum at Worcester met with Mr. Combe's approval. Its
superintendent physician, Dr. Woodward, was, phrenologically and phy-
sically, the ideal of his class. "Large limbs, a large abdomen, large
lungs, and a large head." A mixture of all the temperaments, and a
head with well-developed animal propensities, but one in which the moral
sentiments and intellect predominate, complete the portrait.

"This combination," says Mr. Combe, "produces a powerful and commanding
person, characterized at once by vivacity, energy, and softness; and a mind in
which intellectual power is chastened by the most kind and cheerful moral dis-
positions. If that well-spring of spontaneous vivacity which accompanies large
lungs and a large brain be wanting, the individual will be more apt to sink
under the depressing influences which the diseased minds of his patients will
exert over his own, than to excite their faculties to more healthy and agreeable
action. If he be deficient in the moral organs of the brain, he will want sym-
pathy, softness of expression, and justness of feeling; while if he be deficient
in the reflecting intellectual organs, he will want sagacity to trace effects to
their causes and to discriminate character; or if the deficiency be in the ob-
serving organs he will lack the power of attention to incidents and details."
(Vol. i. p. 57.)

In this asylum ventilation is carefully attended to. The warm air is
conveyed into the galleries by pipes, which open near the ceiling, and
from thence into the cells which communicate with the gallery, by
openings above the doors; as it is found that warm air diffuses itself
more agreeably than when the pipe opens at the floor. Each cell has
an aperture into an air-chimney, and all the air-chimneys open into a
vast garret with numerous windows for letting out the noxious air: by
this plan the air-chimneys are protected from the wind, which otherwise is
apt to descend in cold weather. The patients are treated on the humane
system. A ball is given at Christmas, to which they look forward with
great pleasure. One fourth are allowed to go into the village on errands
unattended, and only one man has escaped. "Social parties are given
from time to time, with music and dancing, which, with religious wor-
ship on Sundays, have an excellent effect on the minds of the patients."
The music is performed by them. Dr. Woodward thinks that more than
an average number of shoemakers are insane, owing to their ill-venti-

lated rooms and shops, and unfavorable position whilst working.   He
thinks that there should be asylums for drunkards; regarding intem-
perance as a physical disease, generally curable, but that confinement
is almost essential to prevent the temptation until the patient is cured.

No one will deny that confinement would be the greatest blessing to
a confirmed drunkard; but how is the line to be drawn between those
who have lost entirely their command over their will, and those who by
strong mental exertion might reclaim themselves?   The exertions of
Father Matthew and, in a minor degree, of temperance societies, show
that, at least, if drunkenness is a physical disease, it is one of those
diseases which the mind can control: and in the present state of society
we cannot make people virtuous on compulsion, however desirable it
might be.

The condition of lunatics in America, as in this country, is still capa-
ble of great amelioration. In a return of the lunatics in the state of New
Hampshire in 1838, some were "in cages and cells, some in irons and
chains, and some in jails." (p. 197.)   At a new pauper lunatic asylum
near New York, and under the management of the corporation of that
city, Mr. Combe was surprised to find not the slightest arrangement had
been made for ventilation; and there was a similar deficiency in an
orphan-school under the same management.

> "The consequences are visible in the appearance of the children: many of
> them are suffering under ophthalmia, and they present generally that sunken,
> inanimate, and unhappy aspect which betokens blood in a bad condition from
> imperfect nutrition and impure air.   There is, I believe, no stinting of food;
> but the digestive functions suffer from the confinement in an unwholesome at-
> mosphere, and hence the nutrition is imperfect." (Vol. i. p. 226.)

One cause of this is in the political condition of the country.   "The
poor, the insane, and the criminal have few, and these not noisy, advo-
cates, and their interests are postponed;" and besides, "it is an unpo-
pular duty to expose the imperfections of any American institution."
(Vol. i. p. 227.)

Mr. Combe was informed that the average of insanity is higher among
Quakers than among the general community, for two reasons: "First,
their doctrine of the workings of the Holy Spirit, and their inward light,
their narrow circle of interests, and limited education act unfavorably
on minds predisposed to disease.   Secondly, they intermarry exten-
sively within close degrees of consanguinity." (Vol. ii. p. 144.)   The
second is in accordance with the well-known fact, proved by breeds of
cattle, (where there are no such doubts as to the genuineness of the
breed as may often vitiate our conclusions regarding similar effects in
our own species,) that breeding in-and-in impairs the physical perfection
in the offspring; but that a narrow circle of interests and a limited edu-
cation cause insanity in those predisposed to disease, is a statement con-
tradicting well-ascertained facts.   The less highly a people or a class are
educated, and the more primitive, simple, and tranquil the state of
society, the less numerous are the insane.   Insanity increases in the
ratio of (what is called) high civilization.   And instead of agreeing with
Mr. Combe as to the effects on the health of the peculiar doctrines of
this sect, our observation has rather led us to think that the doctrine of
an inward light has induced in such Quakers as sincerely and heartily

embrace it, a serene tranquillity of mind, such as philosophers have aimed at; a quiet mental condition, the opposite to that extreme sensitiveness, irritability, mobility, and morbid restlessness of mind which is too often the hereditary curse of those who are tainted with insanity, and consequently a condition which, in the way most suitable to the individual's own mind, should be assiduously cultivated and encouraged by all those who are unhappily predisposed to this disease. Besides, Mr. Tuke has shown the fallacy of the same opinion, formerly prevalent in England.

The effect of solitary confinement upon the brain, according to the physicians of the New Jersey State Prison, is to enfeeble its whole functions: whilst such solitude paralyses the evil propensities, from want of exercise, it equally debilitates the rest of the mind. The prisoners often lose their acuteness and become simpletons. Even when well administered Mr. Combe thinks it injurious, as it is not in harmony with a sound knowledge of the physiology of the brain:

"According to my view of the laws of physiology this discipline reduces the tone of the whole nervous system to the level which is in harmony with solitude. The passions are weakened and subdued, but so are all the moral and intellectual powers. The susceptibility of the nervous system is increased, because organs become susceptible of impressions in proportion to their feebleness. Hence it may be quite true, that religious admonitions will be more deeply felt by prisoners living in solitude than by those enjoying society; just as such instruction, when addressed to a patient recovering from a severe and debilitating illness, makes a more vivid impression than when delivered to the same individual in health; but the appearances of reformation grounded on such impressions are deceitful. When the sentence is expired, the convict will return to society with all his mental powers, animal, moral, and intellectual, increased in susceptibility, but lowered in strength." (Vol. ii. p. 13.)

This weakening of the faculties is observed in all those who have been in the prison more than a year; if the confinement is continued longer, "the most accomplished rogue," says the Report, "will lose his capacity for depredating with success upon the community; if still a rogue, he is one who may be easily detected."

III. *Notes on Phrenology*. Mr. Combe's fixed idea is phrenology, and through its medium he looks at and speculates upon men, manners, politics, religion, and every subject connected with humanity. Much that is common-place, many musings, very evident and unmistakable observations which would not pass in their every-day garments, give a fresh impression of novelty from the unusual clothing in which they are dressed; and this freshness of impression is by no means an unpleasing one. But this is not all. Mr. Combe is an observing and reflecting man, and the results are everywhere visible. Phrenology (independently of its organology or craniology) must be admitted to be a readily-comprehended and easily-applicable classification of the mental powers; a system which, from its practical nature, is calculated to interest a greater number of minds than more abstract metaphysical speculations. It is a generalization of a large number of facts relating to the faculties of the human mind, such as must be of great interest to every inquirer after truth. The intimate connexion between mind and the body is duly recognized. Physiology and psychology are not

divided; but the influence of the temperament of the individual, his state of health, and the action of the air, climate, diet, &c. upon his mental manifestations, are insisted upon. Mr. Combe observes that he met with many acute men in America who understood the metaphysics of phrenology, but were ignorant of the situation of a single organ; and from our own observation we should imagine this also much the case in this country also: many who think themselves incompetent to decide the physiological truth of the system, yet willingly make use of it as a convenient practical adaptation of metaphysics to the elucidation of character.

The following sketch of the temperaments, which Mr. Combe presented in his lectures, gives the leading characteristics of four marked peculiarities of our species in so short a compass, that we cannot forbear quoting it:

"Where the brain is large, and the lungs (as indicated by the chest,) and the abdomen small, the nervous temperament is present, accompanied by fine hair, a fine texture of the skin, great mental activity, and an aversion to muscular motion. When the lungs are disproportionately large in relation to the brain and abdominal viscera, the sanguine temperament is indicated by a fair or reddish hair, blue eyes, and a ruddy countenance, by a great love of muscular action, and also by mental activity, manifested in *action* rather than in study, thought, and composition. When the abdominal region predominates over the brain and lungs the lymphatic temperament, characterized by an unwieldly figure, coarse fair hair, a sleepy eye, and a heavy inexpressive countenance, is present, and then the cerebral action is low, and the mental faculties inactive. The bilious temperament is indicated by a dark skin, dark strong hair, a harshly-expressed outline of the countenance, and a firm compact condition of the muscular system, with great powers of sustained action—either mental or corporeal—corresponding to the quality expressed by the word 'bottom,' when applied to horses." (Vol. i. pp. 127-8.)

"Of ten gentlemen present at this lecture, six presented the combination of the nervous and bilious, two or three the nervous, sanguine, and bilious, and scarcely in one was any trace of the lymphatic to be found."

This certainly corresponds with the mental and bodily activity of the New Englanders, from whom Cæsar would with difficulty have selected his court when he wished for "Men about him that are fat, sleek-headed men, and such as sleep o' nights."

Boston is perhaps the most intellectual city of New England, which was peopled, as it will be recollected, by those who left their own country to enjoy more complete religious liberty. The female heads of Boston are remarkable for their beautiful development of the moral and intellectual departments. "In the men, also, large moral and intellectual organs are very general; but benevolence and veneration are more frequently large than conscientiousness." (p. 131.) The persons who composed Mr. Combe's class were the élite of the city.

Mr. Combe's ruling passion sometimes makes his book very diverting. He goes to a sailors' church to hear Mr. Taylor, and after giving us the text, at full length, this is the next comment: "His temperament is bilious-nervous; the anterior lobe of his brain is long and high, but not broad;" and then a list of his organs. Many children were brought to Mr. Combe for examination with less cautiousness and more self-esteem

than in Scotch children, with very large acquisitiveness. Where the heads were large and the chests small he most judiciously recommended their parents to limit the mental exertions and increase the bodily activity of the children ; advice which cannot be too often repeated and urged upon parents, who by neglecting it either shorten the duration of their children's lives, losing them just when they are most promising, or if unfortunately they survive to maturity these early promises are broken, because the feeble body is incompetent to that persevering and continuous action which successful mental exertion imperatively requires.   Mr. Combe mentions (p. 168,) having seen the common-place book of a young man at Worcester, who had an extraordinary talent for languages. He was a smith, and worked six, eight, and twelve hours a day at his forge, but in his leisure time he learned to read upwards of *fifty* languages with greater or less ease.   " One thing is obvious, that the necessity of forging saved this student's life.   If he had not been forced by necessity to labour he would, in all probability, have devoted himself so incessantly to his books, that he would have ruined his health, and been carried to a premature grave." (p. 200.)

The following observations on the character of the Indians and the Negroes are of interest to the man of science as well as to the politician. The North American Indians are extirpated by war, but never reduced to servitude :

"The development of their brains shows large organs of destructiveness, secretiveness, cautiousness, self-esteem, and firmness, and greater benevolence, conscientiousness, and reflection.   This indicates a natural character that is proud, cautious, cunning, cruel, obstinate, vindictive, and little capable of reflection or combination.   The brain of the Negro shows proportionately less destructiveness, cautiousness, self-esteem, and firmness, and greater benevolence, conscientiousness, and reflection than the brain of the native American. The negro is therefore naturally more submissive, docile, intelligent, patient, trustworthy, and susceptible of kindly emotions, and less cruel, cunning, and vindictive than the other race."   [Hence the difference in their fates—the untameable free-man and the tame slave.]   " In both the brain is inferior in size —particularly in the moral and intellectual region—to that of the Anglo-Saxon race ; and hence the foundation of the natural superiority of the latter over both : but my conviction is, that the very qualities which render the Negro in slavery a safe companion to the white, will make him harmless when free ; the fears, therefore, generally entertained of his commencing, if emancipated, a war of extermination or for supremacy over the whites, appear unfounded : unless, after his emancipation, the whites should commence a war of extermination against him." (Vol. ii. p. 79.)

Much of Mr. Combe's work consists of phrenological speculations on politics, education, and religion.   Those readers who are not phrenologists may be prejudiced against the system, from the author's constantly bending phrenology to his own political, moral, and religious theories ; but the principle should always be borne in mind, that theories are not the facts themselves, but merely attempts to explain, or generalize, or deduce from the actual facts, and that the theory may be wrong whilst the facts on which it was founded remain true.   But however his readers may differ with him in their creeds, they must admit his candour and his fairness.   He states generally both sides of a question, putting strongly and forcibly the arguments of those whom he thinks wrong.

His views and observations may in some instances be incorrect, one-sided, and prejudiced; but he gives the impression that he believes them to be true, that he is firmly bent on promoting the general happiness of mankind, and as firmly convinced that his plan is the right one.

When with this fairness and candour are combined active powers of observation and of reflection, aided by earnestness and indefatigable industry in pursuing an object, the writings of such a man must contain matter for reflection; and we cordially recommend him as a witness whose evidence is worth weighing by all those interested in the habits, customs, politics, and religion, as well as in the "phrenological developments" and physical condition of our transatlantic brethren.

One omission in these volumes is highly creditable to their author, especially as the study of individual character is his favorite pursuit. There is an entire absence of any personal reflections which, although they might amuse many readers and exhibit the writer's own cleverness, and enhance the popularity of his work, might also wound the feelings of an individual. And there is the same absence of ill-natured or satirical observations on habits, manners, or institutions with which so many clever accounts of America are so disgracefully disfigured. From the exhibition of these petty feelings—the indulgence in which is as injurious to the persons who cultivate them as to those who are sensitive enough to be annoyed by them, and which if such people cannot help indulging they should, at least, restrict to their own circle or small coterie, instead of endeavouring to set nations at variance—from such feelings science is very free. There is no disposition here to look with envy or with ill-nature at the progress of science in other countries; but, on the contrary, a tendency to give to foreigners their full and fair meed of praise. And, indeed, although female satirists or writers of piquant books of travels may produce much effect on the students of circulating libraries and of small provincial book-clubs, by their ephemeral superficialities, yet the common sense of England is not to be judged of by such converts. Such books, whatever our transatlantic neighbours may think, are not the text-books here of those whose opinions are worth possessing —of those who candidly look for truth, and who are not to be deluded into the belief that vanities, trivialities, foibles, and vices, from being dressed up in garments different to those in which they are in the daily habit of seeing them clothed at home, are on this account the peculiar fruits of another soil. They feel that the real questions at issue lie much deeper than the mere surface which these scribblers have looked at and attempted to picture as the whole substance. It is to be hoped that the more intimate union which science, by means of steam, has so recently effected, is but the commencement of a more intimate connexion between two great families so nearly related. The greater frequency of intercourse between the leading men of both countries must soften prejudices, and dissipate misconceptions and errors which distance, ignorance, and false witnesses have produced. And we are sure that science, which "emollit mores, nec sinit esse feros," will not be wanting in strengthening a connexion which, as it is for the happiness and prosperity of both parties, as well as for the whole world, should be close and perpetual.

1. *Das Erbrechen; die Wirkung und Anwendung der Brechmittel.* Von
   J. W. ARNOLD, Prof. in Zurich, &c.—*Stuttgart,* 1840. 8vo, ss. 403.
   Vomiting: the Action and Use of Emetics. By Dr. ARNOLD.—
   Stuttgart, 1840.

2. *Die Lehre vom Erbrechen; Nach Erfahrungen und Versuchen.*
   Von Dr. JULIUS BUDGE, &c. *Mit einer Vorrede von* Dr. FRIEDRICH
   NASSE.—*Bonn,* 1840. 8vo, ss. 243.
   The Doctrine of Vomiting, from Observations and Experiments by
   Dr. BUDGE. *With a Preface, by* Dr. NASSE.—*Bonn,* 1840.

IN the works whose titles head this article the physiology, pathology,
therapeutical indications and uses of vomiting are amply and minutely dis-
cussed. Of necessity there is much matter introduced and many facts and
experiments recapitulated which are familiar to our readers.   These we
shall omit; and shall confine our notices to points recommended by no-
velty or practical importance.   The former treatise being the more com-
plete, we shall direct our attention in the first place and principally to it,
making such occasional references to that of Dr. Budge as we may find
necessary.

Dr. Arnold, after a description of the phenomena of vomiting, proceeds
to lay before his reader an historical view of the opinions entertained on the
subject, from the earliest periods to the present.   We do not find that it
would be peculiarly entertaining or useful to introduce here a series of
doctrines and reputed facts which, besides being commonly known, have
been either exploded by more recent and accurate researches, or else
explained in a manner different from that of the original observers.

The mechanism of vomiting. As Dr. Budge justly remarks, (p. 132,)
to treat of this subject in all its relations, would imply a " perambula-
tion" through the whole domain of pathology; and he might have added,
of physiology also.   In the case of certain animals, vomiting is a strictly
natural or normal process.   Several species of polypi get rid of their
excrements by vomiting. Bees in this manner excrete their honey. Many
fishes and birds—as carps, barbels, pikes, herons, eagles, falcons, crows
—vomit the feathers and hair of the animals they prey on.   Some men
ruminate, which is a kind of vomiting; others vomit with great facility.
Dr. Budge is of opinion that the frequent rejection, by children, of the
mother's milk, when infants have oversuckled themselves, is not to be
regarded as a morbid process, since it is performed without the slightest
effort or disgust; the little creatures, as the author observes, oftentimes
laughing in the very act. (Budge, p. 1.)

Three principal views have been entertained as to the mechanism by
which the expulsion of the contents of the stomach upward is effected.
Magendie is or was of opinion that the stomach is passive in the act;
and that the contraction of the diaphragm and abdominal muscles on
that organ is the sole cause of the phenomenon.   This view was adopted
by Richerand, Rostan, Piedagnel; while Marquais, Maingault, Portal,
Tantini, Drs. Graves, Stokes, and Hall have embraced, more or less,
contrary opinions.   Maingault reports experiments in some of which the
abdominal muscles were cut away; in others the nerves of the diaphragm

were bisected and the muscle itself removed, and still vomiting took place. He attributes vomiting exclusively to a gradual anti-peristaltic movement and contraction of the stomach. Portal's observations led him to conclude that vomiting takes place during expiration ; consequently, during the relaxation of the diaphragm. The non-essentiality of the action of the diaphragm to the production of vomiting seems to be decisively proved by the case of Drs. Graves and Stokes, namely, that of a man in whose disease vomiting was a principal symptom, but in whom the stomach was found situated superiorly to the diaphragm, its vomitive efforts, consequently, could not have in any degree depended on the contraction of that muscle. It is, moreover, to be observed that certain birds which have no diaphragm are yet subject to vomiting, or rather, perform it as a natural process.

Dr. Hall's rationale of vomition is as follows : 1, During the act the larynx is closed ; in consequence of which, 2, The diaphragm and its apertures are relaxed; 3, All the muscles of respiration are called into action in the production of vomiting ; 4, But active expiration being impracticable, owing to the closure of the larynx, and therefore all the action of the expiratory muscles being converged on the stomach, vomiting necessarily ensues. As from the relaxation of the diaphragm the thoracic and abdominal cavities are converted into one, it matters not on which side of the diaphragm the stomach is situated. This explanation of Dr. Hall partially reconciles, in Arnold's opinion, the case above quoted of Drs. Graves and Stokes with the views of Magendie.

The experiments of Béclard and Legallois, undertaken at the request of the Society of the School of Medicine of Paris, lead to the following medium views. The stomach, under emetic stimulation, exhibits a gradual and alternate relaxation and contraction near the pylorus and about two inches from it, and even at the organ's middle part, but without vomiting ensuing, provided the emetic excitement produces no further effects than those detailed. If, however, the excitement referred to proceeds further, the œsophagus begins to play an important part : grasping and convulsively carrying upwards the stomachic contents within its reach. But this action of the œsophagus produced vomiting only when the stomach was full of fluid. On cutting the diaphragm also, vomiting could be excited only when the stomach was full. Moreover, on making a section of the abdominal muscles vomiting could be made to take place only when the stomach was kept under the ribs and was full of fluid, otherwise the efforts of the diaphragm and œsophagus were inadequate to the effect. Béclard's general conclusions are, that the stomach is not so influential in the production of vomition as was formerly supposed, but that is not entirely inefficient ; that from it goes forth the " sympathetic excitement" which gives rise to the peculiar contractions of the abdominal muscles and of the diaphragm which accompany vomiting and in part cause it ; that the œsophagus plays a principal part in the process. Finally, he divides the act of vomition into two stages or periods, in the former of which the stomach, though in movement cannot throw off its contents without external support, as of the abdominal muscles, hand, &c., but during which interval the œsophagus is convulsively acting on the stomach as if to draw within its grasp the contents of that organ ; in the second period these contents, brought

within the reach of that tube, are expelled by its independent efforts: efforts which the diaphragm and abdominal muscles do nothing to aid or to maintain.

Dr. Arnold seems to hold very nearly the same views as those now detailed. He does not appear, however, to attach quite so much importance to the œsophagus as an agent in vomition as Béclard appears to do, since he remarks, (p. 90,) that " a very free and rapid vomiting is possible only when the œsophagus is *passive* and opposes no resistance to the impelling cause which brings about the vomitive crisis." Hence it appears that he infers the possibility of that tube being entirely inert during the act.

Dr. Arnold holds (p. 91) that it is only at the beginning of vomition, only during the inspiration which marks the commencement of that act, and while as yet no ejection has taken place, that the diaphragm is in a state of contraction; but that the actual expulsion of the stomachic contents happens only during relaxation of that muscle; *the abdominal muscles* meantime *remaining contracted*.

Dr. Budge informs us that his conclusions were founded on numerous experiments made on himself and others, and also on persons under disease. (Budge, p. 3.) He observes that children whose stomachs are more muscularly energetic than those of adults vomit more readily than these; and that while diseases of the stomach are very frequently accompanied by vomiting, those of the diaphragm and abdominal muscles are seldom so. But in regard to the value of the fact, (as brought to bear against Magendie's views,) that birds which want the diaphragm, yet possess the power of vomiting, he observes that it must hence be not inferred that in them the stomach alone effects vomiting. The muscles which conduce to the respiratory act must, he alleges, cooperate. This, he asserts, is not the case with quadrupeds; in which, by stimulating the pylorus, he has been able to produce vomiting, even when the stomach was withdrawn from the abdominal cavity; although never, in similar circumstances, could he excite it in birds. (Budge, p. 24.)

Dr. Budge's opinion of the power exerted by the stomach in vomiting seems to be somewhat different from that of Arnold. We shall not detail, in all their variety and minuteness, the experiments instituted by the author, but shall relate the chief circumstances of one experiment, by which the power of the stomach to rid itself of its contents, in the way of vomiting, without the aid of the diaphragm and abdominal muscles, seems to be proved. The belly of a dog was incised, and the stomach withdrawn from the abdominal cavity to such an extent as to allow of its pyloric and cardiac ends being visible. The pylorus was then tied. Some soup—but whether emeticized is not stated—was then poured down the animal's gullet. The phenomena which principally relate to the subject of this article were are as follows: Soon after ingestion of the soup the stomach swelled to three times its usual size, and appeared like a greatly distended bladder. Eight minutes after the animal became very restless, and though tied made violent efforts to press its stomach against the table on which it lay. These efforts Dr. Budge thinks were due to the same instinctive impulse which leads us, when under the action of an emetic, to press the hands upon the abdomen. The pyloric end of the stomach now contracted itself and

became hard : all the rest of the stomach appeared distended.   The
pyloric portion made efforts to eject or toss its contents to the left extre-
mity of the organ, and downwards to the great curvature.   The contrac-
tion of the pylorus and the expansion of the stomachic cavity were simul-
taneous, and so rapid as to require close attention on the part of the observer,
in order to note accurately the precise nature of the movements. With every
such convulsion of the stomach there was usually complicated borboryg-
mus, from the air being driven from the right to the left of the organ. As
soon as the spasmodic effort of the pylorus terminated, the other part of
the stomach lost its distension, and at the same moment eructation or
actual vomiting ensued : eructation, if the convulsive act of the pylorus and
and the contraction of the stomach had been moderate and gradual—vomit-
ing if they had been energetic and abrupt. On the stomach being replaced
in the abdominal cavity, vomiting took place much more readily and easily.
Dr. Budge withdrew it again, and placed his outspread hand upon it,
but without exercising any pressure ; and on fluid being anew introduced
into the organ he felt the latter bearing against his hand.   Exerting now
considerable pressure on the stomach, vomiting took place easily ; and
the following fact is worthy of attention, as illustrative of the sympathetic
excitement which, emanating from the stomach as a centre, extends to
all the respiratory apparatus when nausea is felt.   Even when the sto-
mach was lying external to the abdominal cavity, and could consequently
no longer operate, from its bulk, as a stimulus to the abdominal muscles ;
these muscles yet contracted simultaneously with every vomitive effort,
and relaxed themselves immediately on that effort terminating.

   Dr. Budge infers that the stomach may, under certain circumstances,
effect vomiting independently of the diaphragm and abdominal muscles ;
but that in natural and ordinary circumstances these muscles always
cooperate with that organ (p. 34) ; and at p. 24, after referring to the
experiments of Maingault and Béclard, he further concludes that when
the stomach is in its natural situation there is no act of vomiting to
which the diaphragm and abdominal muscles do not contribute : that,
on the other hand, the stomach itself is never inert, but that the stomach
and the muscles always mutually cooperate ; that not only the stomach
but even the whole tract of the intestinal canal sympathises with the pe-
culiar affection of the nervous centres from which vomiting arises, is
proved by the appearance, in cases of long and obstinate vomition, of
fæcal matters in the egesta.

   It may here be noticed, that the peculiar action of the stomach under
emetic excitement consists of a general and gradual diminution of its
volume, having something, so far as we have observed, of a *rhythmic*
character.

   Dr. Budge informs us (p. 25,) that dogs and cats are the most favo-
rable subjects for experiment : that rabbits can be made to vomit only
with the greatest difficulty. Dogs vomit more easily than cats. Indeed,
from the experiment related at p. 38, and the remark which closes it,
(p. 40,) we are led to infer that Dr. Budge generally failed in producing
vomiting in the cat after the stomach was withdrawn from the abdominal
cavity.

   The singular distension of the stomach which characterizes a state of
nausea and seems invariably to accompany vomition, is noticed by

Magendie.   "I was not," observes this physiologist, "a little surprised
to see the stomach become filled with air, in proportion as the nausea
approached.   One could scarcely be deceived in this matter, since the
organ at least tripled its volume. . . . .   The organ disembar-
rassed itself of air and of a portion of aliment : but immediately after
the exit of these matters it was loose, and it was not till after some se-
conds that, contracting itself by little and little on itself, it reassumed
the same dimensions which it had before the vomiting."

Magendie seems wholly to attribute this singular phenomenon to
the entrance and presence of air.   But Dr. Budge, with more accu-
racy, remarks, that the entrance of air is a consequence of the distension,
not the cause of it.   He designates the distension "an active movement
or exertion" (bewegung) of the organ, and thinks it in a great measure
due to the contraction of the pylorus, on the one hand, and of the œso-
phagus, on the other. (p. 41.)

Causes of vomiting in man.   The states of the body which favour or
may occasion vomiting are treated of by Dr. Arnold at p. 95 et seq.
The first of these is the figure of the stomach itself.   Schultz would have
it that the reason children vomit so much more readily than adults is,
that their stomachs resemble more in form those of carnivorous brutes ;
while the stomachs of adults approach more to those of rabbits, hares,
&c.   A better explanation is found in the fact that the stomachs of
children are more conical towards each extremity : the œsophagus is
inserted into the fundus itself ; the great curvature has, at this early
period of life, a very obtuse curve, and runs parallel to the small one.
The stomachs of adults are, on the other hand, more rounded ; the œso-
phagus no longer enters, as formerly, in the left end or the fundus, but in
the space between the left end and the pylorus these two outlets approach
greatly : the small curvature is consequently rendered very acute and short ;
the great curvature has undergone proportional extension and increased
obtuseness of its curve.   In children, consequently, the peristaltic and an-
tiperistaltic movements, and the transmission of the stomachic contents in
either direction are more easy than with adults—the stomach having only
one axis, as it were, in infants, but two in adult life. (Arnold, p. 100.)
The *nervous* mechanism of vomiting we shall come to presently.

Among the states of the body which may give rise to vomiting are
hypertrophy of the mucous or sub-mucous membrane, or of the muscular
coat of the stomach ; carcinomatous disease of that viscus ; inflamma-
tion of the mucous membrane, as pointed out by Andral.   In exanthe-
matous diseases, vomiting is a common symptom.   In connexion with
pemphigus, Gilibert has noticed vesicles in the stomach ; and in fatal
smallpox, pustules have been observed there : aphthæ are also fre-
quently developed in it ; yet in none of the above cases is the occurrence of
vomiting to be regarded as necessarily indicative of the existence of the
appearances referred to in the stomach, since often in the above-named
diseases energetic vomiting is present without the lesions alluded to.

A high degree of excitability of the stomach, a nervous gastralgia, a
lesion peculiarly dynamical and neither depending on or leading to any
structural change, is a frequent cause of vomiting, although there are
forms of dynamic gastralgia in which there is not only no vomiting, but
on the contrary, a great increase of digestive vigour.   The sensibility of

the stomach and its motor power depending on different nerves, there may be pain without vomiting, and vomiting without pain or even nausea. The organ owes its sensibility to the pneumogastric, its motor power to the spinal and accessory and in part to the ganglionic nerves; and hence separate affections of these nerves may produce separate and distinct phenomena; though frequently lesions of the one class of nerves sooner or later involve like consequences in the other.

Alteration of the stomach's secretions, or the presence of abnormal fluids there, as of bile, blood, or metastatic excretions, urinary or uterine; obstruction of the intestinal tube by polypous growths, intus-susception, or hernia; disease of contiguous viscera, as pressure of an enlarged liver, spleen, or loaded colon; or inflammation or calculous irritation of the kidney—may severally occasion vomiting. In the last case, the stomachic excitement may be due to the irritation of the renal plexus extending to the solar or to the vagus, which contributes to the formation of the latter plexus; that irritation being transmitted by the vagus to the medulla oblongata, from which convulsive motory phenomena may be set up in the diaphragm and abdominal muscles. The irritation may moreover be propagated from the renal plexus by the medium of the lowest thoracic nerve to the spinal cord, inasmuch as that plexus is reinforced from the nerve just named.

All violent respiratory efforts may induce vomiting, as excessive hiccuping, coughing, profound sobbing, shrieking, stentorian singing or shouting. This effect is partly due to the circumstance of the respiratory and digestive organs being acted on by the same muscles, partly to their sensibility being derived from the same nerve: and as irritation in the stomach often produces cough by the reflex circuit of the medulla oblongata, so, by the same channel, may cough or any other pulmonary convulsion produce vomiting.

Diseases of the nervous centres often set in with vomiting. This is more especially the case when the medulla oblongata is the site of the morbid affection; and when this happens there is usually contemporaneous respiratory symptoms, consisting of cough, hiccup, &c. Morbid conditions of various parts of the nervous centres, besides the medulla oblongata—as the spinal cord, cerebrum and cerebellum, pons, fornix, corpora quadrigemina, corpora striata—excite vomitive efforts, but not in equal degrees. Abnormal states of the cerebellum produce neither frequent nor violent phenomena of this sort. According to Schwartz, an anti-peristaltic action of the stomach ensues from pressure on this portion of the brain. Burdach affirms that constipation, involuntary evacuations, and vomiting are more frequently caused by disease of the cerebellum; but pure gastric symptoms and diarrhœa more commonly by affections of the cerebrum. According to the same physiologist, vomiting takes place more remarkably from abnormal states of the pons, than from those of the medulla oblongata, cerebrum, or cerebellum. In disease of the fornix vomiting is not a frequent or remarkable symptom. On the other hand, it ensues more commonly from lesions, first, of the corpora quadrigemina, and next of the ventricles, than from those of the cerebrum; from which facts Burdach infers that the corpora quadrigemina stand in the nearest relation to the digestive organs and functions, and that from them the common sensibility and the assimilative

power of the stomach are derived.   Dr. Arnold is of opinion that while Burdach somewhat overrates the degree of connexion, it is not to be doubted that there is a certain relation between the cerebral parts above named and the stomach, and that it is in the corpora quadrigemina that sensations in the latter organ become subjects of *perception* or conscious-ness.   Next to the fornix these *corpora* are the parts of the brain the abnormal states of which most remarkably produce vertigo, terminating in vomiting. (Arnold, pp. 155-6.)

Dr. Arnold's account of the manner in which lesions of the nervous centres produce vomiting is as follows. (p.157.) As it is characteristic of these centres to act eccentrically or peripherally when any excitement is applied to an external part or organ, so when the stomach, which, in relation to these centres, is to be viewed as an external or peripheral organ, is subjected to any irritation, a reactive influence goes forth from the nervous centres, the vital object of which is to oppose or subdue that irritation.   " Now," proceeds the author, " as the medulla oblongata, which commands (beherrscht) the spinal cord and its nerves and also those nerves distributed to the abdominal and thoracic muscles, which, further, receives through the vagus the sensations from the organs of the breast and belly, and which gives rise to the involuntary movements in these organs, through the phrenic and accessory as well as through the spinal nerves, so may excitable states of the medulla oblongata occasion such movements, in like manner as if they were occasioned by a stimulus acting on the digestive or respiratory organs."   We presume that the author means to teach that while direct irritation of the stomach may so affect the me-dulla oblongata as to cause it to send forth reflex influences leading to vomition, so, on the other hand, original disease of the medulla oblongata may cause vomiting without any direct irritation of the digestive organs. This is a universally admitted fact, of which our readers would deem it supererogatory in us to adduce lengthened proof.

Irritable or excited states of the organs of special sense may occasion vomiting, as disagreeable odours or tastes, &c.   This effect is not expli-cable on the mere ground of nervous connexion between the organs of sense, now named, and the stomach, but is due to the peculiar relation in which the former stand to the latter, destined as they are to take cog-nizance of the saporous and odoriferous qualities of substances previous to their being permitted to pass into the stomach, and therefore possess-ing similar sensibilities, with the digestive organs, and sharing its likings and dislikings.   The vomiting which follows, occasionally, from acute or unpleasant sounds, is a neuro-sympathetic affection. It occurs in con-sequence of the auricular branch of the vagus, conveying excitement to the medulla oblongata, from which a " reaction" goes forth to the various organs supplied by the vagus.   Hence follows cough, in the event of the lungs being more affected; vomiting, in the event of the stomach being so.

Affections of the eyes, more particularly irritation of the retina, sudden light, or rapid interchanges of light and darkness, and quick motions in objects looked at, cause vomiting, from the circumstance that such im-pressions of the visual nerves affect the same parts of the brain as those which produce vomiting, namely, the quadrigemina.

At page 160, Dr. Arnold explains the share which the vagus, acces-

sory, and phrenic nerves have in vomiting. As it is through the vagus that abnormal states of the stomach which lead to vomiting are, when sensible, perceived by us; and by the same channel, that irritating causes in that organ operate on the medulla oblongata, it is obvious that this nerve must have an important influence in vomition. Yet animals vomit readily after section of the pneumo-gastric nerve. Thus, in dogs, this nerve being divided, mere barking, running, or twisting of the body is sufficient to cause vomiting. But the apparent anomaly of this case is owing simply to the action of the diaphragm and abdominal muscles; the stomach being passive. The vomiting takes place still more readily, if the accessory nerve is divided at the same time with the vagus; since, thereby, the œsophagus is paralysed, and consequently opposes no resistance to the escape of the stomachic contents. On the other hand, irritation of the accessory nerve will cause vomiting by producing anti-peristaltic movements in the stomach and œsophagus.

Irritation of the phrenic nerve may cause vomiting, by producing violent contractions of the diaphragm; and when hiccup accompanies any gastric or thoracic affection, we may infer that the diaphragm is implicated. And, on the other hand, we may conclude that any affections of the nervous centres which give rise to vomiting and hiccup, have most probably their seat in the medulla oblongata, cerebellum, or corpora quadrigemina. (Arnold, p. 162.)

As to the part, if any, which the ganglionic system plays in vomiting, physiologists are not agreed. Valentine supposes that irritation of the ganglia corresponding to the œsophagus, stomach, and intestines causes contractions of these parts. Budge holds that neither the sympathetic or the cæliac ganglion is the ultimate source of the intestinal movements, but that these nervous parts derive their power from the spinal cord. The cæliac ganglion he regards as having no other office than that of a non-conductor, or " mechanical obstruction" placed on the nerve, to prevent too great sensibility and liveliness of motor power. Dr. Arnold has not been able to satisfy himself, whether there be any unequivocal evidence that mechanical irritation of the ganglia causes contractions of the intestines. In one experiment, such irritation appeared to cause contractions: on several other occasions no such effects followed. Müller, however, informs us that he distinctly observed peristaltic excitement from irritation of the cæliac ganglion; and observes that since the splanchnic nerve is the medium of communication between the sympathetic and the cæliac ganglion, while the cæliac ganglion, on its part, is connected with the spinal nerves, and through them with the spinal cord; hence irritation of the splanchnic nerve may be communicated either immediately or through the medium of the spinal cord, *to the abdominal muscles;* and hence the contractions of these muscles sympathetically and consecutively of emetic irritation of the stomach: the only share which the sympathetic has, in the production of vomiting, consisting, according to Müller, " merely in its conveying, like all other sensitive nerves the impression made upon it to the sensorium."

Some observations and experiments seem to confirm and some to discountenance the alleged fact that irritation of the vegetative nervous system may be the cause of anti-peristaltic phenomena, and of vomiting. In inflammation of the semilunar ganglion, Lobstein, Schwann, and

others have noticed the occurrence of excessive pain towards the verte-
bral column and deep in the hypocondres, accompanied with vomiting :
which phenomenon was, however, several times absent.

At page 164, et seq., Dr. Arnold considers the " *external* influ-
ences on the organism," which may give rise to vomiting. These in-
fluences principally consist of those causes which produce alterations
in the condition of the stomach and intestines, or modify the action of
the diaphragm and abdominal muscles. In this list are noticed tumours
in the gullet, (the vomiting in this case, he would partly account for
from the connexion of the fifth pair with the ganglionic nerves;) undue
distention of the stomach, as stimulating the diaphragm and abdominal
muscles to contract acrid aliment. Under this last head, Dr. Arnold
mentions the case of a man, with whom, from idiosyncrasy, milk never
agreed, and who lost his life by an imprudent use of it, when an adult.

Medicines and poisons are fruitful causes of vomiting; and Dr.
Arnold remarks, in respect of the latter, that occasionally the organism,
by a sort of instinctive vigilance, rejects such substances; and that too
in cases, in which the article swallowed, does not *therapeutically* dis-
pose to vomiting. This notion we regard as fanciful. (p. 171.)

Miasmatic and contagious effluvia often cause states of the organism
which have vomiting for a symptom. The former species, as exemplified
in ague, more particularly affects the biliary system, the spleen, and the
abdominal organs generally. Contagious disease is often characterized
by the same symptom and that too in cases in which the gastric organs
are not peculiarly the seat of affection. In such instances, Dr. Arnold
would impute the phenomenon to " irritation or alienation of the vascu-
lar or nervous systems, or of some organ in sympathetic relation to the
stomach." (p. 173.)

Often in miasmatic and contagious diseases the vomiting is a sign
that the organism is striving to free itself from the depressing influence
of the morbific agent; and the disposition to vomit, if encouraged by
art—as it always ought to be in such cases—often avails to give a milder
character to the impending or commencing malady, sometimes to cut it
short. But often also the vomiting in such cases is but one of the many
signs of general disturbance.

Bitter, insipid, or disgusting substances, especially animal, often cause
vomiting; of the final cause of which, in such cases, we are ignorant. The
author informs us that in former times rasped human nails were used as
an emetic, (p. 174.) The emetic effect in this case must, one would think,
have been wholly due to *emotional* disgust.

Certain movements and postures of the body and the peculiar motions
of a sailing-vessel may produce vomiting. As regards vomition from the
last cause Dr. Arnold enters into some detail. He points out that the
effect is produced sooner and in a more pronounced manner on a sea of
long and gradually swelling waves than on rough, abrupt, and broken
water. And this fact, he conceives, is opposed to the theory of those
who would explain the phenomenon from *mere* agitation or shaking
(erschütterung) of the head. Neither can it be accounted for solely or
chiefly on the supposition of determination of blood to the brain—of the
occurrence of which there is little or no proof. Against the notion that
sea-sickness is entirely owing to a peculiar affection of the visual organs,

caused by constant changes in the position and appearance of the surround-
ing objects and landscape, militates the fact that blind persons are as subject
to the affection as those who see. Even if the inferences now referred to be
allowed to have some subordinate influence in the effect, it is clear that
they are not the principal causes. The actual and chief cause of sea-
sickness lies in a peculiar affection of the corpora quadrigemina. Accord-
ing to Burdach's experiments, the corpora quadrigemina are the part of
the brain from affections of which, more than from those of any other
portion, the phenomenon of vomition ensues, and he admits that as the
visual nerves, affected by the incessant change of objects, may propa-
gate their temporarily morbid state to the corpora, the chain of sympa-
thetic actions, thus formed, may be allowed to account, in part, at least,
for sea-sickness in the case of those who possess vision. But as blind
persons are not less liable to the affection, he explains the sickness in
their case on the ground that the corpora quadrigemina being one of the
chief organs of the bodily movements, the continual efforts of persons on
board ship to maintain their equilibrium must produce some peculiar
affection of these bodies ; and since these, of all parts of the cerebral he-
mispheres, have the most important *psychical* influence in digestion (psy-
chische moment) and regulate the general sensibility and the assimila-
tive process of the digestive organs, it is easy to account, from the dis-
turbed state of the corpora quadrigemina, for the consequent and cor-
responding condition of the stomach. Moreover, no part of the brain,
except the fornix, is more directly concerned than are the corpora quadri-
gemina in the production of vertigo, which so conspicuously accompanies
sea-sickness—another proof, in Dr. Arnold's apprehension, of the cor-
rectness of this theory. Dr. Budge's explanation of sea-sickness is
somewhat vague and unsatisfactory. (Budge, pp. 187-9.) Müller has
some very brief and general speculations on the subject of vertigo, and
makes the following singular remark : " It is possible, however, that the
revolving motion of the body may cause an aberration of a more subtile
principle than the particles of the cerebral substance of blood ; in fact,
an aberration of the nervous principle itself, such as affects the sensorium,
so as to produce the apparent motions of objects." (Bayly's translation,
vol. i. p. 848.) There is some obscurity in this observation, and the
only comment we make on it is, that the eminent author unphilosophi-
cally assumes what he cannot prove, namely, the existence of a nervous
principle distinct from the cerebral substance. That there *may* be such
a principle cannot be denied ; but just as little can it be proved that
there *is* such a principle : and in such a state of matters, therefore, the
negative view is at once the more becoming and the more scientific.

Physiological effects of vomiting. The second part of Dr. Arnold's
work is devoted to the consideration of " the changes in the organism
which are connected with and which follow upon vomiting." (p. 181.)

As regards the influence of vomiting on the digestive organs, it is to
be observed that when the act is what may be called idiopathic, not symp-
tomatic of any ulterior derangement, but simply an effort of the stomach
to disburden itself of, for example, indigestible aliment, the relief obtained
is usually unmixed, and unequivocal. But in other cases, and sometimes
even in the case referred to, there accompanies and follows the act a
feeling of anguish, weakness, or an exalted sensibility of stomach. The

natural vigour of the digestive function may receive a temporary prostra-
tion.   This is more remarkably the case where the exciting cause has
greatly deranged the digestive organ, previously to having urged it into
actual vomition ; or when this act itself has been violent, long-continued,
or frequently recurrent.   The favorable signs attending or rather fol-
lowing vomition are, disappearance from the tongue of any morbid coating ;
from the mouth of an insipid, slimy, bitter, sour or unnatural taste ; ces-
sation of the vomiting itself, preceded by the œsophageal ejection of the
exciting cause, such as morbid secretions or indigestible aliment ; with
return of the relish for food, and ability to retain and digest the same
without inconvenience.

    The continuance and violence of the vomiting, which depends on in-
cipient cerebral disease, added to a loaded tongue, ill taste, deficient ap-
petite, but, above all, the occurrence of gastric and biliary symptoms,
soon reveal to the observant physician the formidable disease with which
he has to contend, and of which the vomiting is but a symptom.   Ileus
often seems to occur *after* energetic vomiting, and is accordingly apt to
be mistaken for a consequence of it ; but the order of relation is just the
contrary. The same remark applies to hernia, hypertrophy of the stomach,
and several other lesions.   It may be here noticed, that in vomition of
this violent character, the stomach may be lacerated ; of which accident
cases are recorded by Boerhaave, Guersent, Bouillaud, Andral, &c.
This grave catastrophe is usually preceded by ramolissement. Sometimes
the lower part of the œsophagus is the seat of rupture. In the one case,
effusion of the stomachic contents takes place into the pleural cavity ;
by pressure of which on the lungs or heart, life may be instantaneously
extinguished.   In the other case, the stomachic contents pass into the
peritoneum.   In either case, inflammation destroys the patient, in the
event of life lasting so long as to allow of this process being set up.

    Severe and protracted vomiting sometimes gives rise to anti-peristaltic
action of the intestines, terminating in the ejection upwards of fecal
matters.   The more usual effect of vomiting on the intestinal canal is
simply an increase of the alvine secretions and stools.   The sudden aug-
mentation of saliva, during nausea and vomiting, Dr. Arnold says, is "per-
haps owing to the determination of blood to the head."   The biliary and
pancreatic fluids flow in profusion partly owing to the pressure of the
abdominal and diaphragmatic muscles.   All the secretions likewise lose
something of their usual spissitude in the course of vomiting.

    In noticing the effect of vomiting on the womb, Dr. Arnold states that
certain emetics, among which ipecacuan is enumerated, are apt to pro-
duce hemorrhage from that organ.

    During the retention of the breath, which immediately precedes the act
of vomiting, both the lungs and heart are apt to suffer : congestion or apo-
plexy of the former, rupture or dilatation of the latter may occur : though
this chiefly or only, where there is predisposition to such accidents from
the presence of previous disease.   In the violent expiratory act, which
instantly follows the retention of breath just alluded to, the contents of
vomicæ and foreign bodies lodged in the lungs or bronchiæ, may be ejected
with great violence.

    Therapeutical effects of vomiting.   The therapeutic and dietetic em-
ployment of vomiting is ancient.   The Egyptians were accustomed to

practise it as a means of inward purification.   The luxurious Romans
frequently took emetics before meals ; and also immediately after them,
in order that, with safety and renewed zest, they might recommence the
feast.   If we remember aright, Cæsar, being invited to spend a day with
Cicero, at one of his suburban villas, took an emetic before dinner, as a
civil mode of testifying his resolution to do ample justice to the enter-
tainment provided for him by the immortal orator. It would appear from
an observation of Dr. Arnold, that this bad habit is beginning to prevail
among the academic youth of his own country, (p. 212,) to whom, he in-
forms us with regret, the words of Cicero may be applied : " Ab horâ
tertia, bibebatur, ludebatur, *vomebatur !*"

Our own Fothergill was very partial to the use of vomiting as a dietetic
means : and thought that judicious recourse to it, at proper intervals,
might contribute to prolong life.   But the most remarkable eulogist of
vomiting is Mentzel : who singularly enumerates atrophy as among the
diseases which systematic vomition is fitted to avert; Bremser, on the
other hand, observes with greater justice, that a frequent use of emetics,
by enervating the stomach, cannot fail to induce general debility ; and if
so, it is not easy to see how longevity can be secured or promoted by the
employment of them.

We suspect that the use of emetics, in the case of substances (more
especially of a pointed form, as a fish-bone, &c.,) being impacted in the
pharynx or œsophagus, is problematical ; even supposing it to be pos-
sible to administer emetics in such circumstances.   In the cases of this
description which have come under our notice, vomitive efforts appeared
to be rather prejudicial than the contrary, by engaging the foreign sub-
stance more deeply in the soft parts.   However, in some particular cases,
the plan may be worthy a trial.

When poison has been swallowed, especially of an acrid or narcotic
nature, prompt evacuation of the stomach is obviously necessary ; but
care must be taken that the emetic does not merely add to the mischief
already inflicted.   Tickling the fauces is a safe plan ; introducing the
stomach-pump is equally safe, and more efficient, when the poisonous *in-
gestum* has been fluid ; but when it is solid, emetics are needed.   Orfila
gives, in the first place, two or three grains of tartar emetic, with from
twenty to thirty grains of ipecacuan ; and after waiting for some time,
(the first dose, we presume, having been unsuccessful,) he gives a second,
consisting of the same quantity of tartar emetic combined with an ounce
or an ounce and a half of Glauber salts, in order to carry down the
stomachic contents into the intestines and compel their evacuation in
this manner.

Dr. Arnold justly observes that in cases of redundant mucous secre-
tion of the stomach and bowels, the benefit to be derived from emetics
is temporary, not radical or complete ; such discharges depending on a
morbid state of the mucous membrane.   Vomiting, whether induced by
nature or art, serves merely to disembarrass the stomach, for a time, of
the slimy profluvium ; but other treatment is required in order to a per-
fect removal of the disease, which more usually depends on irritation
than relaxation.   He mentions the hydrochlorate and tartrate of ammo-
nia as the most useful emetics in cases of slimy mucus, from the property

which these salts possess of dissolving the secretion ; but they are not to be resorted to in inflammatory states of the stomach.

The influence which vomiting has on various other affections of the stomach, bowels, and adjacent viscera, as the liver, spleen, lungs, kidney, nervous system, and organs of sense, is set forth with amplitude and sufficient accuracy and intelligence. There are, however, in this part a considerable degree of diffuseness and an unnecessary reproduction of information already familiar to all moderately informed practical physicians. For these reasons, and in order to keep within due limits, we must pass over, without notice, this part of the volume, and proceed to the fifth section, in which vomiting is considered in its therapeutical and pathological aspects, and the best means are pointed out, now of exciting and now of alleviating it.

Mere motion will, as has been already remarked, give rise to vomiting, and may therefore be occasionally selected as a means for producing the same. Thus, certain movements in a bed, hammock, or swing create nausea and vomition. Rotatory motion is an effectual means, and in this case the sickness follows much sooner should the patient be standing or sitting than in the horizontal position. Now vomition may in this manner be usefully induced in cases in which a rapid effect is desirable or indispensable—as, for example, when poison has been taken ; but in which the sensibility of the stomach is injured. It is useful also, according to Esquirol, in mental affections, which are preceded by signs of great vitiation of the gastric secretions.

Sea-sickness is peculiarly adapted for the milder mental affections, as hypochondria ; and among corporeal derangements, for swellings of the lymphatic glands.

Tickling the fauces, &c. is suited, as a vomitive means, for cases in which the stomach is very much distended, and a disposition to vomit either already exists or may be easily excited. It is to be had recourse to also when an emetic cannot be swallowed or else cannot be obtained, yet in which the necessity for it is urgent, as in cases of asphyxia or poisoning. It is a means, however, not to be depended upon, and which seldom fully effects the desired end.

Insipid drinks, such as lukewarm water, sweet or oily fluids, &c. are to be used rather as a subordinate means of facilitating, increasing, and prolonging vomition induced by other means, than to be employed as independent ones.

Medicinal emetics. Emetics are derived from the three kingdoms of nature, but principally from the mineral and vegetable. Antimony is the principal emetic from the former source, and is in general effectual. When not so, and when incautiously administered in an overdose, it may prove fatal. It is indicated as an emetic—1st. In the case of strong but not too excitable subjects, and in persons not too debilitated by age or disease. 2d. In cases in which prompt and powerful vomition is desired, and in which the subsequent evacuations from the bowels which may possibly follow are not dreaded as too debilitating. 3d. In cases in which it is an object to lessen the spissitude of the secretions, whether of the alimentary or respiratory passages, and of the tegumentary surface, and to maintain these in an active state ; also to forward the appearance of

febrile eruptions.   4th. To remove obstructions of or torpor in the lymphatic and glandular systems, and to stimulate the function of absorption.   5th. In some cases of inflammation and hyperemia tartar emetic is useful, not only by disembarrassing the stomach and emptying the vascular system, but, when given in small doses, by its peculiar effect on the inflamed organs, provided they be such as owe their sensibility to the vagus.

Sulphate of zinc is praised (p. 370) for its efficacy in detaching false membranes in the air-passages; an effect which tartar-emetic and ipecacuan often fail of accomplishing.   It is adapted to cases of apoplexy, asphyxia, and mental disease, and will often excite vomiting when poison has been taken, and when the stomach, from reduced sensibility, resists the action of other emetics.

The preparations of copper constitute extremely prompt and efficacious means of inducing vomiting.   The union of sulphate of copper and tartar-emetic is affirmed (p. 373) to be extremely efficacious in thoroughly emulging the biliary receptacles, without debilitating the digestive organs.

Ipecacuan is the chief emetic from the vegetable kingdom.   The indications for its employment are stated to be, a tendency to diarrhœa, with nausea and other circumstances, as a foul tongue, &c. suggesting the propriety of an emetic.   2d. Great debility, by which stronger emetics—as antimony—are contra-indicated : spasms.   3d. Hemorrhage from the rectum, uterus, lungs, or other organs, in which the revulsion of an emetic is likely to be useful.

Other emetics are named, as iris-root, asarum, white hellebore, &c., used by the ancients, but now never employed.

Few or no substances from the animal kingdom are ever had recourse to as emetics.   The eggs of the barbel are said to act as such.   According to Ettmüller, the eggs of ants have a similar effect.   Dr. Arnold tells us (p. 388) that " rasped human nails digested in wine, and taken after being filtrated, excite energetic stools and vomiting !"

In administering emetics the state of the vascular system must be considered ; and in the case of plethoric persons and those predisposed to apoplectic seizures, venesection must be premised.   When the sensibility of the stomach is greatly reduced, or vital power is low, brandy taken along with or subsequently to the emetic will facilitate the operation of it.   The same effect will be produced in like subjects by a blister to the epigastric region, or hot epithems there.   With some excitable persons the administration of opium on the night previous to the taking of the emetic is almost the only means of ensuring the operation of the latter. The exhibition of emetics in clyster is an uncertain and awkward method.   Schwerer asserts that five grains of tartar-emetic, dissolved in warm water and held in the hand, will produce emesis.   According to Cox, a moist tobacco-leaf laid on the epigastrium will do the same. There are, no doubt, many occasions when it might be desirable to bring about vomition in this indirect manner, by which the general vigour of the patient, and the strength of the digestive organs in particular, would be spared.   We all know that vomiting may be produced by the introduction of a solution of tartar-emetic into the veins.   Perhaps the deglutition of tobacco-smoke might be made to answer the end.

But we must pause here : and the length to which our remarks on Dr. Arnold's volume have extended preclude us from entering on an examination of the extremely interesting, but perhaps less accurate, connected, methodical, as well as less complete treatise of Dr. Budge. Both works are in the highest degree creditable to the medical literature and science of Germany; and furnish the best possible evidence of the zeal and talent which characterize our professional collaborators in that part of the Continent.

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Art. VI.

Third Annual Report of the Registrar-General of Births, Deaths, and Marriages in England.—*London,* 1841.   8vo, pp. 362.

HAVING on two former occasions expressed our sense of the value of these Reports, and finding the present one amply sustaining the character of its predecessors, we do not deem it necesary to enlarge at present either on the general utility of registration or the skill with which it has been conducted by the Registrar-General and Mr. Farr.   The lovers of variety, and they only, will feel any disappointment from these successive volumes.   Relating as they do to the same people, under the same circumstances—or slowly changing circumstances,—and in a climate of which, though it is a variable one, the variations in different years observe a great correspondence, much variety in the details should not be expected.   Nor is it found excepting in the article of epidemics; and these, if we mistake not, will ever constitute the main variable quantity in the general sum of sickness and mortality.

A comparison of some points in the present Report and that which preceded it will evince this.   In the Report for 1838-9, of 100,000 deaths in the metropolis there occurred from epidemic, endemic, and contagious diseases, 26,372 in males, and 26,677 in females; from smallpox, 7636 in males, and 7040 in females; and from typhus, 7817 in males, and 7859 in females; whilst in the present return the number of deaths from the whole class in the metropolis is, males 20,716, and females 21,886; from smallpox, 1500 males and 1311 females; and from typhus, 3961 males and 4120 females.   When we turn to another district we find the proportions in the respective years reversed.   The district selected comprises Manchester and Salford.   There the population are, for 1838-9 of all epidemic, endemic, and contagious diseases, 22,829 males and 24,246 females; whilst in the Report for 1839-40 they stand, 30,340 males and 34,761 females.   But we find the larger proportion of the general class involving the smaller one in the case of two epidemic diseases belonging to it, and vice versâ—the smaller comprising the larger, for whilst, in 1838-9, smallpox stood (males) 6655, and (females) 6967; and typhus, 7007 males and 7225 females; in 1839-40, in the much more numerous class of epidemic diseases, there were of smallpox but 3851 males and 5061 females, and of typhus only 4120 males and 5061 females.

Variations of course occur in the prevalence in different years of certain sporadic diseases.   We observe such in diseases of the respiratory organs, and those of the circulation, for example, in comparing the co-

lumns of the singularly valuable tables (Table O of the former Report, and Table U of the present one,) from which we have extracted the discrepancies in the amount of deaths from epidemics; but they are much less considerable than in the latter case.

The following is the Registrar-General's statement of births, deaths, and marriages for the three years registered, showing an increase for the year 1839-40 under all these heads:

	1839-40.	1838-39.	1837-38.
Births . . .	501,589	480,540	399,712
Deaths . .	350,101	331,007	335,956
Marriages . .	124,329	121,083	111,481

The increase in the number of births registered in the year ending June 30, 1840, over those in 1838-39 is 21,049, and over those in 1837-38, 101,877. That is, the number of deaths in the same year exceeds those of the two preceding ones by 19,094 and 14,145, respectively; whilst the excess in the case of marriages amounts to the respective numbers of 3246 and 12,848. The increase in the number of registered births is ascribed by the Registrar-General to a continuance of the successful operation of the new law. The excess in the number of marriages, as compared with 1837-38, is ascribable to the imperfection of the registration of that year consequent on the change which then took place in the law; but that in the present Report, as compared with 1838-39, is mainly attributable to increased population. This excess amounts, as we have stated, to 3246. But it is calculated that the population of England and Wales, on January 1st, 1839, exceeded by 225,000 the population on January 1st, 1838; and as the ordinary proportion of marriages to population is nearly eight annually to every 1000 persons, more than 1700 marriages may be ascribed to the increase of the population; and the excess, independent of such increase, is thus reduced to little more than 1500.

In Mr. Farr's Letter to the Registrar-General—which is of course a valuable one—on the causes of death in England and Wales, we are informed that the mortality of 1839 was less than that of 1838; and, due allowance being made for the increase of the population, the annual rate of mortality for the two years was found to be:

	Males.	Females.	Mean of the sexes.
1838 . . .	2·28	2·12	2·20 per cent.
1839 . . .	2·23	2·07	2·15 ,,

The diminution in the mortality was 2·4 per cent. among males, and 2·6 per cent. among females, or exactly $2\frac{1}{2}$ per cent. in the two sexes. In explanation of this diminution Mr. Farr remarks that the two great epidemics of smallpox and typhus were on the decline; and the winter was mild, compared with the severe season of 1838. The increase in the mortality of 1840 he ascribes to the distress prevailing in certain populous districts of the kingdom.

As was remarked in the Report of last year, various diseases affected the two sexes in an unequal degree. Some of these do so on a principle sufficiently obvious, such as difference of structure. This appears to be the case with regard to carcinoma, though we should scarcely have expected the proclivity of the female mamma and the uterus to cancer to

produce so great a discrepancy as we observe in this Report in the prevalence of this affection in the two sexes; for whilst 660 males died of it, it was fatal to 2031 females—a proportion greater than three to one. The numbers in the Report for 1838 stood 620 and 1828 of the respective sexes; there being an increase in the last year of 243, viz. 40 males and 203 females. On the same obvious principle—difference of structure —is to be explained the preponderance of deaths in males from hernia, stone, cystitis, and nephritis, which we find existing, and in pretty nearly the same proportion in the present as in the preceding year. The greater fatality—which is as manifest in the present as in the last Report, and in nearly the same proportions—of bronchitis, pleurisy, pneumonia, asthma, and some other diseases, will, as Mr. Farr remarks, be justly considered due to exposure to inclemencies of the weather. More boys, however, he adds, than girls die of pneumonia under one year of age, where this cause can have no influence.

The subject of violent deaths is that on which Mr. Farr has dwelt at greatest length, and one on which he has brought forward much valuable information. Of deaths referred to " external causes or violence," 12,055 occurred in 1838, and 11,980 in 1839. The number of suicides was less in 1839 than in 1838; but the proportions at different ages, in different parts of the country, and in the seasons of the year remained unchanged. The tendency to commit suicide, Mr. Farr remarks, appears to increase up to the age of sixty, and to be then more than three times as great as at the age of twenty-five. These points he illustrates by a table of the ages of 1985 suicides, which occurred in 1838-39. From this table it appears that to 10,000 living at each period the suicides were, from ten to fifteen, $0·7$; from fifteen to twenty, $3·9$; from twenty to thirty, $5·9$; from thirty to forty, $9·1$; from forty to fifty, $14·0$; from fifty to sixty, $19·3$; from sixty to seventy, $19·0$; from seventy to eighty, $15·0$; and from eighty to ninety, $10·3$. We regard it as an extraordinary fact that two persons are recorded as having committed this crime, aged from ninety to one hundred.

Pursuing the subject of suicide, the Report presents a table illustrative of the relative prevalence of this crime in different localities. The proportion is highest in the metropolis, being there $10·9$ to 100,000 inhabitants; next to this discreditable preeminence stand the south-eastern counties, bordering on the metropolis, where it is $8·4$ to 100,000; the range in other parts of England is from $6·8$ to $4·4$, which is the proportion in the western counties, whilst in Wales it is but $2·2$. The proportion throughout England and Wales is $6·3$; and the total number in the year was 2001. The greatest number of suicides occurred in the spring and summer; when crimes attended by violence, and also attacks of insanity are also most common. Thus, in April, May, and June there were 563; in July, August, and September, 539; in January, February, and March, 484; and in October, November, and December, 465. The suicides in males were considerably more than double those in females; for of the 2001 examples of this crime, 1387 occurred in the former and 614 in the latter sex, the proportions being as 23 to 10.

" Of 162 ascertained suicides," says Mr. Farr, " of the age of twenty, and upwards, whose occupations were stated, 18 were labourers, 10 tailors, 8 shoemakers, 6 seamen, (1 of the 6 was a commodore, 2 were captains,) 5 licensed

victuallers, 5 servants, 4 merchants, 4 coachmen, 4 bakers, 4 paupers, 3 medical men, 3 officers or soldiers, 3 clerks, 3 engravers, 3 cheesemongers, 3 weavers, 3 smiths, 3 masons, plasterers, or house-painters, 3 gardeners, 2 attorneys, 2 watermen, 2 beadles, 2 printers, 2 moulders, 2 saddlers, 2 tobacconists, 2 shopmen ; and there was 1 of each of the following—sculptor, artist, teacher of music, translator of languages, architect, bookseller, copperplate printer, colourer of prints, hook-keeper, corn dealer, cattle dealer, coal dealer, farrier, coach proprietor [formerly], horsekeeper, cooper, carpenter, painter and glazier, cabinetmaker, coachmaker, coachplater, chairmaker, caneworker, pencil-maker, pianoforte-maker, gun-maker, pocketbook-maker, comb-maker, parchment-maker, boiler-maker, brass-founder, brass-finisher, gold-refiner, jeweller, water-gilder, china-mender, dyer, grocer, greengrocer, currier, dresser of Spanish leather, hairdresser, hempdresser, lodging-house keeper, licensed hawker, milkman, porter, patrol, waiter, potboy, dealer in old clothes. The professions of 8 suicides were not stated ; 4 were registered gentlemen." (Letter to the Registrar General, p. 78.)

The tendency to suicide is least among persons carrying on occupations out of doors ; and greatest among artisans who are weakly from birth, are confined in-doors, have their rest disturbed, or have little muscular exertion. The statistical illustration of this point shows that 1 in 9382 masons, carpenters, and butchers committed suicide in the year ; and 1 in 1669 tailors, shoemakers, and bakers ; the tendency to suicide in the first class being as 1 to 5·6 in the second. A similar result is obtained by comparing the suicides in the class of labourers with those among artisans and tradespeople ; for the tendency to suicide is more than twice as great among artisans as it is among labourers, in the former class the proportion being 6·0 to 10,000, in the latter but 2·9 to the same number. In the miscellaneous class, designated by Mr. Rickman " capitalists, bankers, professional and other educated persons," the proportion is 4·9 to 10,000.

Mr. Farr does not grant much force to the opinion of M. Roué and certain theoretical writers, that suicide is most common where education is most diffused. He admits that in England suicide is most frequent in the metropolis, the south-eastern counties, and the northern counties, where the greatest number can write, and is the least frequent in Wales, where the proportion of persons signing the marriage register with a mark (the Registrar-General's test of deficient education,) is the greatest. But he remarks very particularly regarding these facts :

"There is a general, but no constant relation between the state of education, thus tested, and the commission of suicide. It may be admitted that there is some relation between the development of the intellect and self-destruction ; but the connexion must be in a great measure indirect and accidental. In opposition to the arguments derived from agricultural districts and labourers in towns there is the fact that suicide is more frequent among several classes of artisans than it is among better educated people. If the progress of civilization is to be charged with the increase of suicide, we must therefore understand by it the increase of tailors, shoemakers, the small trades, the mechanical occupations, and the incidental evils to which they are exposed, rather than the advancement of truth, science, literature, and the fine arts." (Ibid. pp. 80-1.)

Apparently to show the distinction between the influence of education, abstractedly considered, and circumstances with which a certain amount of education is occasionally associated, Mr. Farr mentions the

facts, that about 2·0 to 10,000 persons assured in the Equitable Society, and 7·8 in 10,000 dragoons and dragoon-guards have been ascertained to commit suicide every year.

We can see no reason for supposing that education gives a tendency to suicide; but those districts in which education—indicated by the proportion of the population who can write—is most diffused, contain the most numerous class of artisans occupied within-doors. Now there is in such persons, as compared with a sailor or agricultural labourer, a low state of health, and a morbid sensibility which may give a proneness to self-destruction. As a general rule, these trades are least exposed to accidents; and Mr. Farr remarks that the mind left unexcited by natural dangers imagines and creates causes of death. We would say rather, that the individual rendered morbid, moody, and sensitive by seclusion from free air, variations of temperature, muscular exertion, and light, sees in the circumstances around him—viewed through the diseased condition of mind which these very circumstances have engendered—a reason why life is no longer desirable, and, consequently, an incentive to the act of suicide.

Regarding this crime Mr. Farr suggests:

"That some plan for discontinuing, by common consent, the detailed dramatic tales of murder, suicide, and bloodshed in the newspapers is well worthy the attention of their editors. No fact is better established in science than that suicide—and murder may perhaps be added—is often committed from imitation. A single paragraph may suggest suicide to twenty persons; some particular chance but apt expression seizes the imagination, and the disposition to repeat the act in a moment of morbid excitement proves irresistible. Do the advantages of publicity counterbalance the evils attendant on one such death? Why should cases of suicide be recorded in the public papers, any more than cases of fever?" (Ibid. p. 82.)

We should certainly see no objection to stripping tales of murder, suicide, and bloodshed of their dramatic character; on the contrary, we should think it highly desirable, if they are invested with such an one; but we are by no means convinced that the evils of *ungarnished* publicity transcend its advantages. Even in the case of suicide, where the advantages of publicity are less manifest than in that of other crimes, is there not much reason to suppose, from our knowledge of the mental state of those having a suicidal tendency, of which state sensibility even to a morbid extent is a prominent feature, that the certainty of exposure by the public press, and the disgrace which such exposure would entail on their memory and their kindred, may have in many instances a preventive effect? that the mind which had not quailed before the dread of death may have been deterred from the crime by the fear of disgrace? In the case of other crimes—murder, for instance—the advantages of publicity are still more manifest; for the instances, we have reason to know, are numerous where information circulated by newspapers throughout the country has led to the discovery and apprehension of the criminal.

In the following suggestions, however, for the prevention of suicide we cordially concur:

"It may be remarked that the artisans most prone to suicide are subject to peculiar visceral congestions; that suicide is most common in unhealthy towns; and that the influence of medicine on the mind and on the unstable or ungovern-

able impulses which are often the harbingers of suicide is incontestable. To place the shoemaker, tailor, baker, or printer in the same favorable circumstances with respect to air and exercise as carpenters and masons would be impossible. But the workshops of all artisans admit of immense improvements in ventilation. Cleanliness is greatly neglected. Neither the men nor all the masters appear to be aware that the respiration of pure air is indispensable; that the body requires as much care as the tools, instruments, and machines, and that without it neither the body nor the mind can be kept in health and vigour. The new parks and public walks will afford the artisan an opportunity of refreshing his exhausted limbs and respiring the fresh air; and the health and temper of the sedentary workman may be much ameliorated by affording facilities in towns for athletic exercises and simple games out of doors, which, while they bring the muscles into play, unbend, excite, and exhilarate the mind. Moral causes and the regulation of the mind have perhaps more influence on the educated classes; but all must derive benefit from out-door exercise." (Ibid. p. 82.)

We are far from accusing the gentry and the capitalists of this country of hard-heartedness or want of sympathy with their labourers and artisans; but we do impute to them neglect of one means of ameliorating their condition. Is a great landowner or manufacturer in England ever seen (as we have seen those of the same class abroad,) furnishing his humbler tenants or work-people with the means of out-door recreation, and joining and guiding them in their sports, as now, fortunately for the health, discipline, and efficiency of our army, its officers may be observed doing? No : the most industrious labouring class in the world are left, amid their almost ceaseless and unmitigated toil, to the sole solace of the alehouse or, by way of interlude, to the foul air and frowzy harangues of the chartist club. We trust that an admonition to the wealthy of the land, conveyed through so important a public document as the Report of the Registrar-General, will not fall on deaf ears or besotted understandings.

The mortality from other violent deaths in the different classes of workmen is inversely as the suicides. Three in 10,000 tailors, bakers, and shoemakers, and 9 in 10,000 masons, carpenters, and butchers, were killed by accidents or violence—the reverse of the proportion in suicide. The degree of danger which besets the different classes of the community in their occupations is shown in the following proportions. Of the educated and wealthy classes there perished 2·9 in 10,000; of tradesmen and artisans, ·5·1 ; of infirm persons, paupers, and others, 6·6; of servants and coachmen, 9·5; and of labourers, 15·0. Till the returns of the causes are made up, the proportionate mortality by violence among sailors, watermen, and fishermen cannot be calculated ; though Mr. Farr thinks that it was higher than in any of the preceding classes. The total proportion who died by violence was 8·6. The occupation of engineer is at present the most dangerous followed : 21 engineers, stokers, and firemen were killed in one year in the metropolis, chiefly in the steam-vessels on the Thames.

Valuable tables are furnished, in which deaths by violence are classified according to the nature of the injury occasioning them. In the metropolis, Birmingham, Manchester and Salford, Liverpool and West Derby, the mining districts, and the agricultural districts of Norfolk and Suffolk there perished by mechanical injury (gun-shot wounds, other

wounds, with loss of blood, and fractures and contusions,) 1189 males and 232 females—total, 1421; by chemical injury, (lightning, explosions, burning, scalding, and poisoning by opium, arsenic, medicines improperly given, and other substances not stated,) 521 males, 580 females—total, 1101; and by asphyxia, (drowning, hanging and strangling, inhaling mephitic gases, and suffocation), 823 males, 245 females—total, 1068; whilst by causes not specified there died 210 males, 39 females—total, 249. The whole constitutes a grand total of such deaths in the districts specified of 2743 males and 1090 females—total, 3839.

It will be observed that, contrary to the rule of mortality from other causes of violent death, the proportion of females who perish from chemical injury exceeds that of males. This is explained by Mr. Farr in the remark that burns from their clothes taking fire are the most common cause of violent deaths in females; 77 males and 159 females (two fifths of the females who perished by violence,) died of burns in the metropolis.

Violent deaths are least common in the agricultural districts, more frequent in cities and manufacturing places, and most fatal in the mining parts of the country. Abstracts have been made exhibiting an analysis of the violent deaths in the metropolis, Manchester, Liverpool, Birmingham, Norfolk, and Suffolk, and the principal mining districts. From the table thus formed it appears that of 100,000, 68 perished from such deaths in the metropolis; 74·8 in Norfolk and Suffolk; 95·2 in Manchester, Liverpool, and Birmingham; and 120·6 in the mining districts. The great excess in the mining districts falls under two heads—fractures and contusions, and explosions, scalds, burns, and lightning. The fractures and contusions in these districts are as 53·2 to 21·6 in the metropolis, to 20·6 in Norfolk and Suffolk, and to 35·0 in Manchester, Liverpool, and Birmingham. The explosions, scalds, and burns are, in the same districts, as 38·8 to 14·6 in the metropolis to 20·7 in Norfolk and Suffolk, and to 28·3 in Manchester, Liverpool, and Birmingham.

In considering these proportions it must be remembered that the mortality from accidents is much greater than these proportions would indicate, because the accidents occur only to those engaged in certain occupations; whereas the estimates are based on the entire population of the district, however occupied. From these causes Mr. Farr is at a loss whether to ascribe the great discrepancy in the deaths from violence in the different mining districts to the greater fatality of the works in the more fatal situation, or the greater density of the mining population. The discrepancy in the different mining districts is very great. Thus, in the mining parts of Shropshire, Staffordshire, and Wales, with a population of 306,614, the violent deaths in one year were 541; in those of Northumberland and Durham, with a population of 318,941 they were 340; and in the mining parts of Cornwall, with a population of 239,379, they were 283.

In Table P, page 86 of this Letter, Mr. Farr presents the proportion of deaths by violence in 10,000 deaths from all causes in the metropolis, from the middle of the seventeenth century to the year 1829. This long space of time he divides into four periods, viz. from 1647 to 1700, from 1701 to 1749, from 1750 to 1799, and from 1800 to 1829. From the comment on this valuable table we learn that in the first period 7, in

the second 5·2, in the third 5, in the fourth 3 per cent. constituted the annual rate of mortality; whence it may be deduced that in the seventeenth century 6·8 in 100,000, in the eighteenth century 5·4, in the nineteenth 5·0 died violent deaths. Out of a given amount of population the deaths by drowning increased in the latter half of the eighteenth century; the deaths by scalds and burns were twice as great in 1800-30 as in the seventeenth century. The tendency to suicide remained nearly stationary; so did death by poisoning. All the deaths by personal violence rapidly decreased. In a population of 100,000, according to these accounts, about 23 were killed, 4·6 murdered, in the seventeenth century; in the nineteenth century about 13 were " killed" and 0·5 were murdered. The chance of being murdered diminished ninefold.

The violent deaths in Sweden, Prussia, and France are stated in Table Q, page 86, of Mr. Farr's Letter, and are there compared with the results of the English returns. In a population of 100,000 the suicides were in Sweden 5·1, the accidental deaths 62·6, total violent deaths 67·7; in Prussia, suicides 9·0, accidental deaths 39·6, total violent deaths 48·6; in France, suicides 8, accidental deaths 18·7, total violent deaths 26·8; England and Wales, suicides 6·4, accidental deaths 68·2, total violent deaths 74·5.

Some omissions and incompleteness in the foreign returns are pointed out by Mr. Farr; but after every deduction has been made for these defects, the mortality by violent deaths in England is greater than in Sweden, Prussia, France, and probably any nation in Europe in which civil war is not raging:

"The reason of this is explained by the preceding analysis, without implying any extraordinary negligence. Relatively to the proportion of England, few countries have such an extent of coast, rivers, and canals, or so many men employed in navigation; so many fires, furnaces, and chemical processes in operation, medicines and poisons distributed in so many shops; so many mines, manufactures, and buildings; so many horses, carriages, and railways; such a vast amount of force of every description at its disposal. The great number of violent deaths in England may therefore be accounted for on the assumption that the danger in the manufactures, mines, and conveyances is the same as in other countries, but that the frequency of exposure is greater." (Ibid. p. 87.)

The author prudently abstains from any lengthened disquisition on the means of diminishing deaths by violence, especially those of a mechanical nature, judiciously considering that with the facts of the Report before them, the investigation of individual cases, and careful observations made on the spot, the factory and railway inspectors may be able to offer many valuable suggestions; and useful results, too, connected with the mining districts may be expected to emanate from the Children's Employment Commission. With regard to deaths from poisoning he gives the following pertinent suggestions. The sale of prussic acid, opium, nux vomica, oxalic acid, corrosive sublimate, and arsenic to the public may be prohibited, or permitted only by medical prescription. The master's certificate may be required for sugar of lead and poisonous substances employed in the arts and manufactures.

In most of the following remarks relative to the foul air of mines we cordially concur:

"The carburetted hydrogen and carbonic acid are rarely dense enough to prove immediately fatal in coal mines; but in small doses they are poisons—

they give rise to diseases; *and admitting fully the power of Davy's admirable invention—the safety-lamp—to enable miners to breathe carburretted hydrogen without producing explosion,* no choice can exist between the employment of this lamp and an efficient system of mechanical ventilation, by which all insalubrious gases may be removed, and the men may be supplied in the remotest parts of the mine with pure air." (Ibid. p. 89.)

We feel convinced that in the portion of this passage which we have printed in italics Mr. Farr has overrated the power of the " Davy." It will not at least enable men to *continue* to breathe carburetted hydrogen without risk of producing explosion. It is a security against sudden and unforeseen explosion, and is on this account a very valuable invention; but if its admonitions furnished by the blaze *within* the lamp are disregarded it becomes heated, and causes the explosion against which it was invented to guard the workmen. Limited to the object to which it was destined by its admirable inventor, it is of inestimable value; employed, as it too often is, as a cheap substitute for the really efficient security to the lives and health of the workmen—an adequate plan of ventilation—it is highly dangerous, as the great loss of life which has taken place in our collieries since its invention but too clearly testifies.

The phrase " sudden death" in the tables applies to cases in which inquests have been held; but the cause of death not having been ascertained, a vague verdict, such as " died by the visitation of God," has been returned. It is obvious that an enlightened man like Mr. Farr, in common with all other enlightened medical men throughout the empire, must be desirous of seeing an advance made beyond the usages of an institution which, however valuable for the prevention and detection of crime in a comparatively barbarous age when homicide was frequent, requires to have infused into it a new spirit to meet the requirements of the present condition of science. This is considerably provided for by the Registration Act, which enjoins that in every case in which an inquest shall be held on any dead body the jury shall inquire of particulars herein required to be registered concerning the death, and the coroner shall inform the Registrar of the finding of the jury, and the Registrar shall make the entry accordingly. (6 and 7 William IV., cap. lxxxvi, sec. 21.) " One of the particulars required to be registered" is " the cause of death." By an autopsy alone can this be discovered; and we hope that we shall not henceforward find coroners and their juries, we believe on a mere principle of parsimony, profess themselves satisfied with their own external view of the body, and conceive that they have done their duty when they have couched their belief that no murder has been committed, in the vague phrase, " died by the visitation of God."

Inquests should now be held not merely with the view of detecting crime; but coroners possessing by Mr. Wakley's Medical Witnesses' Act the power of summoning before them the best medical testimony, they should apply themselves diligently to the illustration of the causes of sudden death. Were this done, we should soon have on a much more ample scale statistical facts regarding the causes of sudden deaths as precise as those furnished by M. Devergie, the medical director of the Morgue in Paris. According to this gentleman, quoted by Mr. Farr, the following is a summary of 40 cases of sudden death carefully examined:

" Apoplexy, with a clot on the annular protuberance, 1; meningeal apo-

plexy, 3; serous apoplexy and pulmonary congestion, 2; congestion of the brain and spinal marrow, 3; pulmonary congestion, 12; pulmonary and cerebral congestion, 12; hematemesis, 2; syncope, 2; rupture of the heart, 1; rupture of the pulmonary artery, 1." (Ibid. p. 94.)

In this country, in 1087 inquests which occurred in London, the verdicts " visitation of God," or " natural death," were returned 632 times. Apoplexy was said to be the cause of 53 sudden deaths, and diseases of the heart and arteries of 27, exclusive of 10 ascribed to rupture of a blood-vessel. In a group of well-investigated cases of sudden death, we should certainly have expected to find disease of the heart a more frequent cause than M. Devergie has observed it. The term rupture of a blood-vessel, employed in English verdicts, we have generally found very vague, most frequently meaning effusion of blood into a large, tubercular cavity, but often hemorrhage of any sort anywhere.

Art. VII.

1. *Handboek der Ziektekundige Ontleedkunde.*   Door W. VROLIK, Med. Doctor, Hoogleerar aan het Athenæum te Amsterdam, enz. Eerste Deel.   *Aangeborene Gebreken.—Amsterdam,* 1840.   8vo, pp. 590.
Manual of Morbid Anatomy. By W. VROLIK, M.D., Professor at the Athenæum of Amsterdam, &c.   Vol. I. *Congenital Diseases.—Amsterdam,* 1840.

2. *Specielle pathologische Anatomie.*   Von Dr. KARL EWALD HASSE, ausserordentlichem Professor der Medicin zu Leipzig.   Erster Band. —*Leipzig,* 1841.   8vo, pp. 526.
Special Pathological Anatomy. By Dr. K. E. HASSE, Professor Extraordinary of Medicine at Leipzig.   Vol. I.—*Leipzig,* 1841.

3. *Handbuch der Pathologischen Anatomie.*   Von CARL ROKITANSKY, Med. Dr. Custos der k. k. pathol. Museums, und a.ö. Professor zu Wien.   III. Band.—*Wien,* 1842.   8vo, pp. 632.
Manual of Morbid Anatomy. By CARL ROKITANSKY, M.D., Conservator of the Royal Imperial Pathological Museum and Professor extraordinary, at Vienna.   Vol. III.—*Vienna,* 1842.

WE have here the first published volumes of three systems of morbid anatomy, each important not only by the extent of the plan on which it is commenced, but by the reputation of its author. Dr. Vrolik (the worthy son of a veteran anatomist, who, though he long ago earned an European reputation, still labours diligently in medical science,) is already well known by extended and successful investigations in both comparative and morbid anatomy, in the knowledge of which he is second to none in Holland. In the present work he proposes to bring into a systematic form all the knowledge which he has acquired of morbid anatomy, whether from the works of others, or from the rich stores of facts contained in his own and other Dutch museums; stores such as no other country in Europe can boast of. In its plan, his work is more complete than any hitherto published. Of this first volume, half is occupied by a clear and accurate account of all the circumstances of the normal development

of the embryo, and of each of its several systems and organs. The second division relates to the deviations of development in general, including all the varieties of extra-uterine pregnancy, and the diseases of the ovum. The third is occupied by the congenital defects due to arrest or hindrance of development, and includes the descriptions of fissures or permanent openness of parts, hydrocephalus, and hydrorachitis, and the acephalous monsters. On all these subjects it is, so far as our present knowledge goes, complete. The second volume will conclude the account of congenital diseases; the third and fourth will be devoted to diseases after birth. Judging by the examples before us the work when finished will deserve to be the text-book of all to whom it is accessible; but who will translate it? At some future time we shall analyse the parts relating to monsters, and supply much of its interest to the general reader; but all its value will, we fear, long remain unknown to those who will not learn Dutch that they may read it.

Dr. Hasse's work is one not on morbid anatomy merely, but on pathology; for in each case the author discusses the general features of the history of the disease, as well as its signs after death. It is an admirable compendium of the writings of preceding authors, and is really beautifully written. It contains little of original observation, and not many new interpretations of facts; but for the student, or for one not far advanced in the knowledge of pathology, it is admirably adapted. This volume includes the diseases of the organs of respiration and circulation.

Unlike the two preceding, Dr. Rokitansky's book is no more than it professes to be; it is morbid anatomy in its densest and most compact form; scarcely ever alleviated by cases, histories, or hypotheses. It is just such a work as might be expected from its author, who is said to have written in it the results of his experience gained in the careful examination of 12,000 bodies, and who is possessed of a truly marvellous power of observing and amassing facts. But at present we need say no more; for in the following pages we purpose giving an analysis of the best contents of this volume, with occasional illustrations from that of Hasse, and with some comments. In this we hope to render some service to our readers, for, valuable as it is, there is not much probability that Rokitansky's work will be translated, and it is written in such vile crabbed Bohemian-German that few even of those to whom good German is familiar will ever wade through it.

The present volume will be, when the work is completed, the third and last. The first will relate to general morbid anatomy; the second to the morbid anatomy of the nervous, vascular, and motor systems; this contains the descriptions of the diseases of the respiratory, digestive, urinary and genital organs. In the mode of arrangement there is nothing striking; our notices may therefore follow the order of the work itself.

AFFECTIONS OF THE TRACHEA AND BRONCHI. A change in the trachea is described which will be recognized by many, and which Rokitansky regards as the result of repeated and chronic attacks of tracheal catarrh.

Dilatation of the trachea. "It is a dilatation of the posterior wall of the trachea, proceeding from hypertrophy and relaxation, with or without a hernial extrusion of the mucous membrane. . . . . The posterior wall of the trachea is relaxed, and presents an increase of surface which is especially obvious in the transverse direction. The mucous membrane, the transverse muscular fibres

behind it, and the mucous glands, are at the same time increased in volume, and the gland-ducts are dilated ; while the elastic, yellow, longitudinal fibres are attenuated and wasted. If the extrusion of the mucous membrane now take place, it passes gradually between the thickened transverse muscular bands, in the form of a fissure, or a funnel, and, at last, of a saccular recess, which is placed transversely, and is for the most part deepest near the ends of the tracheal rings. . . . .   The larger this hernia or diverticulum is, the more prominently do the muscular fasciculi that limit it, stand out upon the inner surface of the trachea ; upon which, when the herniæ are numerous, and follow closely upon one another, they form a lattice-work of transverse bands. . . .   Such dilatations sometimes extend through the whole trachea, and even beyond it to the bronchi." (p. 3.)

Dilatation of the Bronchi.   After describing the generally known uniform and saccular dilatations of the bronchi, Rokitansky points out

"A particular variety, the saccular dilatation of the extremities of the bronchi. These are often seen in the form of thinly-membraned vesicles filled tensely with air, which are set singly, or in groups, in the neighbourhood of the cicatrix-like contractions at the apices of the lungs after the extinction of tuberculous disease.   One or more bronchial tubes compressed by the shrunken pulmonary parenchyma, at last obliterated, pass through the substance of the lung (where it is impermeable by air and full of pigment, and of obsolete and calcified tubercles), and at the periphery expand into sacs which, according as the tube is obliterated or merely compressed, either resist pressure or may be slowly emptied." (p. 5.)

Of the origin of ordinary bronchial dilatation he adopts a view nearly allied to that of Dr. Corrigan. He believes that the dilatation is a secondary affection ; that the primary change is a shrivelling and shrinking up of some portion of the parenchyma in consequence of bronchitis in the terminal branches ; and that there is thus produced a tendency to a vacuum which is filled up by the stretching of one or more of the adjacent bronchial tubes. The chief positive evidence which he adduces for this view is the fact that there is always collapsed or wasted pulmonary tissue in the neighbourhood of a dilated bronchus ; and that the degeneration of the former is always proportionate to the dilatation of the latter. But the explanation is, we think, unsound. When a part of a lung shrivels, there is no portion more capable of resisting the relatively exaggerated atmospheric pressure than the bronchial tubes, if their tissues be healthy. The pressure being equal upon every part of the air-tubes and cells, the latter must dilate long before healthy tubes ; and hence it is that the shrinking of a part of a lung is so commonly followed by hypertrophy or vesicular emphysema of the adjacent parts.   Dr. Corrigan's view is more reasonable inasmuch as he admits the additional influence of the contraction (comparable to that of the liver in cirrhosis,) of the tissue around the dilated bronchus.   But, we believe that he also excludes too much the probability that the tubes themselves are diseased before their dilatation.   The change is, doubtless, as Dr. Stokes has maintained, very analogous to the formation of aneurisms.   By degeneration of its coats, (and, probably, in most instances, of the surrounding tissues also,) a part or the whole of a bronchial tube loses its elasticity, and it is dilated partially or throughout by an atmospheric pressure which it could before resist ; just as an artery weakened by anormal deposit yields to an average pressure of the blood, and becomes dilated or aneurismal.

The mere contraction of tissue round a bronchial tube can never pull its walls asunder ; the arterial walls are much more extensible, yet no contraction or shrivelling of the tissues round them ever produces dilatation or aneurism ; for either of these to occur it is essential that the arterial walls themselves should first be weakened by disease.

Tuberculous disease of the trachea and bronchi. The account of tuberculous disease of the air-passages deserves particular notice. In the larynx, where he has never seen it occur without similar disease in the lungs, Rokitansky admits two primary forms of deposit ; the grey granulation (miliary tubercle) in the submucous cellular tissue, and the yellow caseous tubercle infiltrated in the mucous membrane. Both pass through the ordinary progress of tuberculous disease ; and both may, though they very rarely do, heal. Tuberculosis of the trachea is, he says, extremely rare ; an assertion, the seeming strangeness of which he clearly explains in the next passage.

" One often finds," he says, " in laryngeal phthisis, little ulcers of the mucous membrane of the trachea, and they are frequently so numerous that they coalesce. They are shallow, and for the most part of an elongated, rounded, or strip-like form ; they have slightly concave bases, are sometimes not discernible, except when the light falls obliquely upon them, appear raw or excoriated, pale or dark red, are uncovered, or covered only by a creamy diffluent exudation, and are surrounded by a livid redness, or a sharply-defined red areola. They are situated especially on the posterior wall of the trachea, often extend into the trunks of the bronchi, are sometimes strikingly predominant on the right or left side of the trachea or the corresponding branches, according as the right or left lung is chiefly diseased, and often occur at the same time in the fauces and on the mucous membrane of the mouth. But these [which will be at once recognized as corresponding to those usually regarded as tuberculous ulcers of the trachea] have nothing in common with the [real] tuberculous ulcer : they are the results of an exudative aphthous process, which is especially associated with the active laryngeal phthisis." (p. 37.)

Besides the common tuberculous affection of the bronchial tubes in the neighbourhood of cavities, or tuberculous infiltration, he describes a " primitive bronchial tuberculosis," occurring especially in children, and commonly accompanied by an intense tubercular disease of the bronchial glands.

" It is a disease of the terminal branches of the bronchi ; at least it developes itself originally in them, and extends from them into the larger tubes. It occurs especially, like pulmonary tuberculosis (ordinary phthisis), in the upper lobes, but is contrasted with that disease, in that it is frequent in the peripheral or superficial ramifications, affects a larger section of the bronchial tree, and that, on a transverse section, one finds the pulmonary parenchyma traversed by large, thickly-walled, bronchial tubes, filled by caseous tuberculous matter. It is often combined with tuberculous infiltration of the pulmonary parenchyma, but often is completely independent. In the latter case the obstruction of the bronchial tubes leads to obliteration of the vesicles, and wasting of the parenchyma connected with them, and one then finds the obstructed tuberculous bronchi branching in a ligamentous, shrivelled, elastic, and tough tissue. The tuberculous matter, in these cases, passes through its usual changes. It either softens, and then the bronchial walls are not unfrequently destroyed, and involved in collections of tuberculous pus, collections in which (contrary to those which are far more frequently formed by softening of pulmonary tubercle) the destruction of the bronchi is the primary change ; or else the tuberculous matter undergoes another, the calcareous, metamorphosis, which is especially apt to occur when the bronchus has been completely closed by it." (p. 38.)

This description is the more important because it affords, we are persuaded, a correct account of that tuberculous disease of the bronchi in which Dr. Carswell has, far too exclusively, made ordinary phthisis to consist; and of which others, with an equally unfounded exclusiveness, have denied the existence.

AFFECTIONS OF THE PLEURA.   On the diseases of the pleura we find nothing striking in Rokitansky; but Hasse has two important observations.   He has made a series of preparations of false membrane, by drying them, in conjunction with the adjacent portion of pleura, upon glass, in which state the blood-vessels and their contents are quite distinct.

" In all the cases," he says, " in which vessels had formed in the false membranes, they were immediate continuations of the branches ramifying in the serous membrane.   These entered the false membrane at various parts, and branched in it partly in stars, partly in groups of tufted, nearly parallel, lines.... I have repeatedly placed portions of a similar gelatinous exudation which had been floating freely upon glass, to seek for independent vascular formations in them, but I have never succeeded in detecting a trace of vessels in them; so that I might fairly maintain, that if ever vessels are formed in such loose flocculi, they must have been at some former time fixed to the pleura, and subsequently detached from it." (p. 250.)

Hasse mentions also (p. 252), that where tuberculous matter has been effused with the ordinary products of pleuritis, it may be collected in an isolated mass, and undergo the calcareous metamorphosis, becoming converted into hard, earthy concretions, in the form of uneven, rough plates, which may sometimes be split into two layers, containing between them some of the remains of the caseous matter, and adhering tightly to both surfaces of the pleura.   But we do not find any marks by which it can be decided that these are not ossifications of false membrane rather than calcified tubercles.

AFFECTIONS OF THE LUNGS.   This division of the subject is full of important matter, more especially the work of Rokitansky.

Emphysema of the lungs.   Rokitansky's description of the anatomical characters of this affection is exact.   In his explanation of its causes he adopts a view somewhat similar to Laennec's, believing that it is commonly the result of forced inspirations, such as occur in croup, hooping-cough, &c.   But he carries this opinion (which is probably true for a few cases) to the extent of ascribing the emphysema which is usually called spontaneous to a similar cause.   It happens, he says, in persons who lead a sedentary life, and who therefore breathe but little with their diaphragm and abdominal muscles.   These muscles, therefore, become weak and atrophied; and, for compensation, their possessors must inspire, though seldom, yet deeply and forcibly, with the other inspiratory muscles, and especially with those at the upper part of the chest; hence the greater frequency of emphysema at the upper and anterior parts of the lungs.

We think this explanation, though it be somewhat ingenious, very weak.   Such emphysema occurs in active as well as in sedentary persons. The latter too needing, from their habits, less respiration, can afford to employ their diaphragm and abdominal muscles less than others, and that without needing compensation.   Besides, to say nothing of the frequency of emphysema in horses, whose habits are the very opposite of sedentary, and of its greatest frequency in heavy, slowly-moving horses, whose re-

spiration is most even, the fact that it is often hereditary proves that it is in great measure independent of accidental external causes, and that though these may have some influence in making its existence sooner or later obvious, yet that it is mainly due to an original weakness of the walls of the air-cells in parts or the whole of a lung.   In consequence of this weakness the cells cannot, for the ordinary term of life, resist the average atmospheric pressure, and they are therefore gradually stretched. In certain cases a similar weakness of the cells is doubtless acquired by disease, producing some organic change, and destroying the elasticity of their walls, so that they yield to ordinary atmospheric pressure, and still more certainly to the force of repeated, sudden, and deep inspirations. The same diseases, also, probably produce those changes which are sometimes found in the tissue adjacent to the emphysema, and which Rokitansky, and many others, refer to the pressure of the emphysematous portions.   But these can exercise no unusual pressure on the parts around them ; the air-cells do not *grow* as they are distended, but are merely *stretched* by the atmospheric pressure, to which alone, therefore, the adjacent portions are subjected, as well after as they were before the production of emphysema.

Pulmonary apoplexy.   Neither Rokitansky nor Hasse accept the opinion recently advanced, that pulmonary apoplexy is due to blood effused in the bronchial tubes and thence passing into the cells.   The former adheres to Laennec's opinion, that in general the air-cells are its primary seat, and quotes in support of his view, 1st, that infarctus (compact apoplectic effusion,) has often been found when there has been no hemoptysis, which could scarcely fail to occur if the blood were poured into the bronchial tubes ; and, 2dly, that pulmonary apoplexy is commonly connected with hypertrophy of the right ventricle, which could scarcely influence the bronchial arteries.   We fully agree with him ; but should point out obstruction at the left side of the heart as more important than the (usually coincident) hypertrophy of the right side ; for the latter often exists without any tendency to pulmonary apoplexy, as, for instance, in emphysema of the lungs.   We may add, too, that the nonoccurrence of pulmonary apoplexy in emphysema is good evidence against its dependence on congestion of the bronchial blood-vessels ; for in no disease are they more frequently gorged with blood.

Pneumonia.   After a brief but comprehensive description of œdema of the lungs, Rokitansky proceeds to the important section on pneumonia, (p. 84,) of which he makes four varieties, namely, croupous, (ordinary or plastic pneumonia,) typhous, catarrhal, and interstitial.   The following are some of the more remarkable passages.

The difficulty of distinguishing simple from inflammatory congestion of the lungs is admitted to be great. He lays down as the distinctive characters of the latter, the *colour* of the parenchyma, which approaches to a brownish red, and its *moistness*, both of which depend on a condition peculiar to pneumonia, namely, the filling of the tissue of the lung by blood which has just entered upon the inflammatory state, and which is brownish or brick-red, thin, but viscid, and mixed with dark grumous flocculi.   Certainly no sign is so generally distinctive ; but it may be added, that the best mode of detecting it is by examining the fluid which may be scraped from the cut surface of the lungs : in pneumonic congestion it always bears some resemblance to the rust-coloured sputa.

The seat of pneumonia Rokitansky holds to be the walls of the air-cells, that is, the pulmonary mucous membrane; so that it might be defined a " parenchymatous croup."

" The characteristic granulations are produced by the product of inflammation deposited in the cavities of the air-cells. Their formation, that is, the exudation, is preceded by the secretion of a sticky, tough, reddish-brown fluid into the cells, which produces the well-known *râle crepitant;* with the hepatization this diminishes, and the pulmonary cells are filled by plastic exudation. The granulation is at first roundish, dark red, rather hard and brittle, and appears, as it were, fused with the swollen dark red wall of the cell, and is difficult to isolate and extract. But as the inflammatory turgescence and the redness of the tissue moderate, the granulation itself becomes paler, reddish-gray, and at last yellowish-gray, its cohesion is diminished, and it swells up a little. A secretion of a glutinous mucus ensues around it, its connexion with the wall of the cell is rendered looser, it becomes more distinct, and appears to be inclosed by a bright red cell-wall, which makes it the more distinct the paler it grows. Lastly, it melts down into a puriform fluid, mixed with the glutinous mucus." (p. 90.)

The following summary of the arguments, in addition to actual observation, by which Rokitansky supports his view of the intra-cellular formation of the pneumonic granulations is, we think, complete and convincing:

" The granulation, regarded as a pulmonary cell swollen and obliterated by swelling, could not present either the anatomical relations or the metamorphoses which we deduce from it as a product of inflammation. The most considerable swelling of the pulmonary cells could not produce the volume of the hepatized lung; while our theory completely explains this fact. If the purulent infiltration were a suppuration of the interstitial tissue, a healing of this stage without abscess and breach of continuity would not be possible; but by means of partial expectoration, and partial absorption of the softened exudation, this takes place without any ulcerative destruction of the tissue, and the anatomical examination of a purulent pulmonary infiltration exhibits the cellular texture of the lung entirely uninjured. Lastly, the same process commonly goes on in the terminal branches of the bronchi as in the pulmonary cells." (p. 91.)

The account of the modifications which the pneumonic product presents in correspondence with the peculiarities in the state of the blood is clearly written; and the descriptions of the catarrhal and the interstitial pneumonia deserve especial notice, for the sake of the very probable explanations which they afford of two anomalous forms of the disease. The catarrhal* occurs very rarely in adults, less rarely in children:

" It is always lobular, always has a bronchitis of the tubes belonging to the diseased portion of the lung associated with it, and is a frequent accident of the various catarrhal diseases of childhood, especially of hooping-cough and *catarrhus suffocativus.* Its especial seat is in the superficial lobules, many of which are often affected, and which become blueish-red, dense, and moderately firm. The walls of the air-cells are swollen even to the closure of their cavities, which, when the swelling is less, contain a watery, mucous, and slightly frothy secretion. There is no trace of a granular texture discernible. The pulmonary substance around the diseased lobules being, for the most part, emphysematous, they appear (when they are situated at the surface,) depressed somewhat below the level, and are distinguished by their dark colour." (p. 107.)

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* The name is unfortunately chosen, though the disease may consist in inflammation of isolated bronchi and their appended cells; for the same term is used by Hasse and many others for the old *peripneumonia notha,* to which it is just as well applicable.

The interstitial pneumonia is that which is very commonly described as chronic pneumonia :

" At first the tissue in the interstices of the lobules and between the smaller groups of cells appears (when there is not too much black pulmonary substance,) pale-reddish, and swollen by albuminous infiltration : the cells are either pale and, according to the degree of that swelling, more or less compressed ; or else, when they participate in the inflammation they are reddened, and sometimes (though always finely) granulated.   In course of time the material infiltrated in the interstitial tissue organizes itself, combines with it into a dense cellulo-fibrous substance, in which the cells are obliterated by the compression, and ultimately is converted into a homogeneous cellular tissue.   One then finds whitish compact stripes, which sometimes creak under the knife, or shapeless masses of the same kind imbedded in the substance of the lung." (p. 107.)

This form, as its usual name implies, is generally chronic in its progress ; it sometimes occurs spontaneously, and spreads from one lobule to another.   It is most frequent at the apices of the lungs, and being often combined with a partial pleurisy, may at last assume all the characters of a cicatrix of the lung.   But more commonly it is a consecutive affection occurring in the neighbourhood of apoplectic effusions, tuberculous collections, &c., around which it forms a kind of capsules.   The new tissue which is produced commonly contains a large quantity of carbonaceous matter.

Phthisis pulmonalis.   The section which Rokitansky has devoted to pulmonary phthisis is one of the best of the volume ; it is so good that, though the subject may be thought by some to have been long ago exhausted, it merits a careful abstract.   Of tuberculous disease of the lungs he says, there are two distinct forms, namely, interstitial tubercular granulation, and tubercular infiltration or infiltrated tubercle.   In the latter the morbid substance is effused in the air-cells themselves, in the former in their interstices.

The tuberculous infiltration is "hepatization by a tuberculous product."   An ordinary croupous or plastic pneumonia deposits its usual product ; and this, under the influence of a tuberculous diathesis, instead of being absorbed or becoming purulent, passes through various discolorations, and is metamorphosed into the yellow tubercle ; in other words, it is tuberculized.   The several stages from the fibrinous to the tubercular matter may be distinctly traced.

The infiltration may be *general*, or, as it is much more commonly, *lobular*, or *vesicular*, and this last is Bayle's pulmonary granulation. (?) It is, however, rarely a primary form ; but occurs usually in advanced stages of the granular tuberculosis.   It indicates a phthisis which has run a tumultuous, acute course, with frequent attacks of pneumonia. It occurs especially in young subjects, and is always accompanied by enlargement and tuberculous disease of the bronchial glands.

The tubercular granulations may be deposited either singly or at greater or less distances, or in groups ; and this *grouped* form is always to be distinguished from the *confluent* variety, in which all the single granulations are closely set together.   The tubercular granulation, in any of these forms, appears first, either as the gray obscurely-transparent mass, of the size of a millet or hemp seed ; or, (as in many cases of acute tuberculosis,) as a granule smaller than a grain of sand, clear, transparent, and like a vesicle ; or, in an intense degree of the tuberculous diathesis, it

may be deposited at once as the yellow tubercle.   In whichever form it occur, its outlines are never sharp, though they seem so ; for little processes may be traced from them into the surrounding tissue.

The granulations thus formed gradually coalesce, and this occurs most quickly when they are from the first arranged in groups.   In this state they form a mass of any shape or size, completely overwhelming the pulmonary tissue, which can be traced in it only by its infiltrated black matter, and a few blood-vessels; but they are still quite distinct from tuberculous infiltration.

The tubercles in the lungs undergo the same peculiar metamorphoses as in other organs, passing through the state of softening to the formation of the cavity or vomica.   Each discrete gray granulation softens from its centre, which becomes turbid, more opaque, and friable, and at last, fluid.   The groups present similar softenings at the centre of each of their component tubercles.   From the former results a small ulcer; from the latter, when all the tubercles have gone through the same process, a larger ulcer or cavity ; and Rokitansky dwells particularly on the mode in which these cavities enlarge.

The cavities thus formed, he says, spread by the successive changes of tuberculization, softening, breaking down, and removal of their walls in a regular eccentric progress; and when these go on rapidly the wall of the cavity consists of nothing but pulmonary tissue infiltrated with tubercle. As they approach, the cavities coalesce, and communicate by sinuses or apertures of various size, or all are laid into one.

But in a slower progress of the disease a more healthy inflammation is set up around the cavity.   An albuminous, grayish-white, or reddish product is deposited, which closes, and ultimately produces a wasting of, the air-cells.   It may be converted into a grayish or blackish layer of dense and tough cellular tissue; and it may be either persistent, or may have tubercles formed within or beneath it, and breaking through it. At the same time also with this effusion without the cavity, (which constitutes the *infiltration tuberculeuse gelatiniforme* of Laennec,) albumen is effused in a layer of soft false membrane within it.   But this is probably repeatedly thrown off as tuberculous matter collects beneath it, breaks through it, and carries it away with the pus of the cavity ; and it may be assumed that in accordance with improvement or deterioration of the patient's health, and as the disease tends towards cure or towards increase, so either this albuminous product or tubercle is produced upon the walls of the cavity.

But in certain cases these albuminous effusions, which are always indications of curative processes, proceed to a proper cure.   And they are not the only modes in which tuberculous disease may be brought to a favorable conclusion ; for in several distinct circumstances its progress is arrested.   1st. There may be a callous degeneration of the tissue around the cavity, or the formation of a membrane within it like a serous or a mucous membrane; the former being usually found when the disease is tranquil, the latter when there is much irritation.   2dly. The cavity may completely cicatrize, its walls gradually falling in and uniting, with obliteration of the bronchi, and sinking in of the surface of the lung, and perhaps of the wall of the chest also.   3dly. The cavity may, after partially shrinking, be filled by chalky matter from the metamorphosis of some

remaining tubercle.   4thly. In the place of the cavity there may be
produced a large callous mass of tissue, like that of cicatrices.   Or,
5thly. The tubercle may not proceed to the formation of the cavity, but
being arrested in its earlier progress, may diminish in size, and be changed
into a gray or dirty-white mass of chalky matter, and at last into a hard
concretion ; changes which may ensue in either the granular or the in-
filtration form.   And, lastly, at a still earlier stage, the tubercle being
arrested in its progress may retrograde and become *obsolete*, shrivelling
into an opaque, blueish-gray, cartilaginous knot, which is indisposed to
any further metamorphosis.

Thus, in any stage of its progress the tuberculous disease may be ar-
rested, and either removed or reduced to a state of inaction : and where,
as is rarely the case, these changes occur in all the tuberculous matter
that has been deposited, and the diathesis is wholly remedied, the cure of
the disease is complete.

Such is Rokitansky's general account of the ordinary progress of pul-
monary tuberculous disease, considered independently of its effects on
adjacent tissues.   It is in nearly every respect exactly accordant with
our own observations, and is certainly both clearer and more complete
than any yet published.   His account of the accidents and associated
phenomena of the disease is not less praiseworthy.   He says rightly that
only large bronchial tubes open into cavities, the small ones being closed
by the secondary tuberculous deposits around and within them, and by
the swelling of their mucous membrane.   The openings into them, when
recent, are always ulcerated, oblique, and abrupt ; but when the wall of
the cavity becomes callous they acquire a smooth edge of tough mucous
membrane, which they retain permanently or till, as is rarely the case,
they are obliterated.   He points out tubercular infiltration as the most
frequent precedent of perforation of the pleura ; and this result is fa-
voured by the frequency with which it occurs, especially at the surface of
the lung, and the rapidity with which it is apt to break down and become
fluid before adhesions are produced over it. In these, as well as in other
cases of perforation, he well describes how the pleura is first distended by the
air passing into the cavity till, having been raised like a small bladder on
the surface of the lung, it bursts, or dies and is thrown off, or else sloughs,
being involved with a small adjacent portion of the lung in gangrene.

AFFECTIONS OF THE STOMACH AND BOWELS.   With some brief re-
marks on carcinoma of the lungs Rokitansky concludes his account of
the morbid anatomy of the respiratory organs, and the best and most
nearly complete section of the volume.   In passing from it, as one does
abruptly, to the account of the diseases of the upper part of the digestive
canal, a striking instance is presented of the inequality in the merit of
different parts of his work. His account of the affections of the lips, mouth,
pharynx, and œsophagus occupies but twenty pages, and is altogether
meager and imperfect : it is scarcely even a complete catalogue of the
diseases of those parts.   The section on the diseases of the peritoneum
is more and better filled, but contains, we think, nothing which is not
pretty generally known, or has not been already published in works that
are commonly read. That on diseases of the stomach is altogether good,
though here also we miss several things, and among them that which
should have formed an important part, namely, the description of the va-

rious appearances of vascularity of the mucous membrane and the im-
port of each.

Inflammations of the stomach. Rokitansky describes four varieties
of this disease—the catarrhal and chronic, the croupous or plastic, the
inflammation of the submucous tissue, and that which is due to the ac-
tion of poisons.   The signs ascribed to the first and last are well known,
though indeed it is not always an easy matter in practice to determine
when those of the former are present.   The second, which is that com-
monly called idiopathic acute gastritis, never occurs, he says, as a pri-
mary disease, except in the flocculent aphthous exudations observed in
children ; an opinion which is seldom questioned except by those who sel-
dom make post-mortem examinations.   But it is sometimes the result of a
degeneration of the process of an exanthema, especially of typhus and
variola, (of which more presently,) or of the passage of pus into the blood,
especially in puerperal uterine phlebitis :

" The third variety, or submucous gastritis, occurs not rarely as a secondary
process analogous to the metastases of certain acute specific dyscrasies, and
is comparable with pseudo-erysipelas. . . . . . One finds the wall of the stomach
thickened, the submucous membrane turgid with pus, rotten and easily torn,
the mucous membrane over it reddened, and in some places tense.   In these
places it at last bursts, most usually over a depôt of pus, and leaves numerous
irregular openings, from which the pus oozes, as through a sieve, upon the in-
ternal surface of the stomach." (p. 183.)

Perforation of the stomach.   One of the most complete descriptions
in the volume is that of the perforating ulcer of the stomach ; of which,
however, Rokitansky's monograph in the Oesterreichische Jahrbucher,
which has been repeatedly copied, is so well known that we may pass
it by.

Softening of the stomach.   Among softenings of the stomach he de-
scribes two varieties, both idiopathic affections, and both to be carefully
distinguished from the effects of digestion after death.   The one is the
gelatinous softening of the stomach in children, of which the characters,
as they are commonly described, are generally known ; the other an ana-
logous change occurring in vascular instead of anemic stomachs, and
presenting corresponding differences of colour.   He mentions also a
similar disease as producing destruction of the lower part, and especially
of the left side, of the œsophagus ; and in a subsequent part of the vo-
lume speaks of a similar affection of the intestinal canal, especially of
the cæcum.

All these, as well as the similar softening and destruction of the dia-
phragm and other adjacent organs to which they lead after perforating
the stomach, are, our readers must be aware, ascribed in England to the
action of the digestive fluid continuing after death and decomposing the
tissues with which it comes in contact.   Evidence more than sufficient
for this view may be found in the works of Hunter, Burns, and Carswell ;
and we regret to find so experienced an observer as Rokitansky follow-
ing the French (we had nearly said the anti-English) pathologists in the
opposite opinion.   Even his own observations, when fairly considered,
are favorable to our view.   He says :

" It is an important fact that softenings exactly similar to those just de-
scribed may take place after death, as the results of a dead chemical process,

in what is called the self-digestion of the stomach. The discrimination whether this or the morbid softening have taken place is, in many cases, very difficult ; nay, unless respect be paid to the state of disease which has preceded death, and to the mode of dying, is even impossible. The following circumstances, however, may be diagnostic of the softening after death : 1. The absence of all phenomena indicative of a softening of the stomach, or of the morbid processes inducing it, during life. 2. Sudden natural or violent death, without preceding disease, during the process of digestion—the stomach being full of chyme. 3. Limitation of the softening to the mucous membrane, and especially to its projecting folds ; together with, lastly, an extension of it beyond the ordinary limits of the morbid softening, and its existence chiefly at those parts on which the greatest quantity of the contents of the stomach has rested." (p. 200.)

Now these characters are, for diagnosis, valueless; they may, and often do, exist alike in the cases which Rokitansky regards as the results of disease and those which he admits to be the effects of digestion. For the first of them, there is no known reason why a stomach which has been functionally or even in some measure visibly diseased, should not be softened and digested after death as well as a healthy one. Gastric disturbance may therefore have existed without having been due to this complete disorganization of a part of the stomach which is found after death. For the second, we can only say that these are not the most common circumstances in which digestion of the stomach occurs; on the contrary, in the majority of persons dying suddenly it does not take place at all. As to the third sign, the limitation when it exists is only accidental, depending on the stomach being contracted ; its absence, therefore, is no indication that the general softening is due, not to digestion, but to disease. And, for the last, the locality here ascribed to the digestive softening is exactly the same as that in which the supposed softening from disease is found, namely, some part of the cardiac half of the stomach.

It is clear, then, that Rokitansky cannot assign one distinctive character between the softening supposed to be from disease and that admitted to be from digestion. This is good evidence that they are identical ; and the proof that both are due to digestion is completed by these facts— that the characters of the softening are not similar to those produced by any disease in analogous tissues—that they are not associated with any of those other changes which should accompany the progress of such extensive disorganization—that exactly the same changes may be artificially produced by the action of the digestive fluid on a dead stomach or other organ—that they have no corresponding symptoms during life—and that they frequently occur in the stomach of those (both men and animals) who have died during perfect health. It seemed necessary to enter thus at length into the question ; for we shall probably ere long find this, as many other errors in continental pathology have been, imported and made popular in England.

After some minute enumerations and brief descriptions of the alterations in the size, form, and arrangement of the intestines, the reading of which was much like the perusal of a long index, we come to the account of their structural alterations—a section full of important subjects, to most of which Rokitansky has done ample justice.

Inflammation of the intestinal mucous membrane. He divides this into four classes—the catarrhal or erythematous, the croupous exudative or plastic, the typhous, and the dysenteric.

The type of the first, or *catarrhal inflammation* is the common diarrhœa from cold, mechanical or chemical irritation, venous congestion, &c. It may be acute or chronic; and in the latter case it may give rise to several well-known, though not generally appreciated morbid alterations, of which he enumerates as the chief, " the brown or slate-gray, or blueish-black discoloration of the mucous membrane," its increased thickness and general volume, the hypertrophy of the submucous and muscular coats, and " the profuse secretion of a turbid grayish-white, or a transparent, jelly-like, ropy mucus."   But in more advanced cases the chronic catarrhal inflammation passes into ulceration, especially when acute attacks are frequently grafted upon it; and now—

" The mucous membrane is changed into a granulated tissue, which is of an intense red colour, easily torn, and on whose surface, as well as in its interior, suppuration ensues.   From the surface the suppuration spreads in depth; in the interior it appears as a depôt of pus, which bursts inwards; in either case there is a loss of substance, which quickly or slowly increases, forming ulcers with swollen, irregular, indented, and undermined edges, and granulating bases which extend into the submucous tissue or even into the hypertrophied muscular coat, and burrow in it in the form of excavated passages, around which the mucous membrane is in the gray or slate-coloured or black state just described, or is in a condition of blenorrhœa, or not unfrequently presents polypous growths." (p. 230.)

An analogous form of disease is the *inflammation and ulceration of the follicles of the large intestines*, which occurs in protracted diarrhœa and lientery; and with which, as well as with that just described, we are better acquainted in England as the state produced by dysentery.   In this disease, in addition to the changes detailed above, the follicles are found either merely enlarged and projecting in round or conical knots on the surface of the intestine, or containing small quantities of pus; or when the pus has been discharged, are replaced by small, round ulcers, with pale, or ash-coloured, or livid edges, and with dull-white or sometimes ecchymosed bases, formed of cellular tissue.   These, however, enlarging and coalescing, soon produce an appearance nearly similar to that of the ordinary diffused catarrhal inflammation.

On the *typhous process* in the intestinal canal Rokitansky dwells at considerable length, and his remarks merit close attention.   Of the typhous process in general he says (and this may express in a brief form his theory of it,) that, anatomically, it is characterized by the deposition of a peculiar product which passes through peculiar metamorphoses. This product (the typhous matter or structure—*typhus-gebilde*,) has, in its origin, and still more in its metamorphoses, the greatest analogy with the cancerous matter, and especially with that of the medullary cancer. The situation in which it is deposited varies according to the special relation of the general process to certain organic structures; but its most usual primary seat is in the mucous membranes (especially that of the small intestines,) and the lymphatic glands.   The local typhous process is an inflammation; not, however a genuine inflammation, such as one supposes to depend on a phlogistic state of the blood, but a typhous inflammation, corresponding to and consequent on the peculiar morbid condition of the blood.   The existence of such an inflammation in the small intestines in typhus is, in Germany, constant; but its development may be arrested, and therefore cases occur in which it seems to be absent, and in which the whole process seems to go on in the blood.

This brief summary of Rokitansky's pathology of typhus is necessary for the appreciation of his account of its morbid anatomy. He has probably carried his notion of the analogy between the materials of cancer and of typhus too far; but this may be discussed when he has published his first volume, in which these general questions will be treated. At present we proceed to the local morbid anatomy of the disease.

He divides the typhous process in the mucous membranes of the small intestines into the four stages of congestion; the deposition or infiltration of the typhous material in its crude state; its loosening, softening, and ejection; and the proper typhous intestinal ulcer. In the first stage there is venous congestion, swelling, and a peculiar succulency of the mucous membrane, especially of its lower part; it has a dull gray colour, and is covered by a thick layer of dirty yellow, jelly-like mucus.

In the second stage these signs are usually concentrated about the Peyer's patches and a few of the solitary glands, which are elevated by the deposition of the typhous material into the well-known *plaques*. This material is a more or less compact, pale, reddish, fibro-lardaceous (*faserig-speckige*), friable mass, which is sometimes traversed by bloody streaks. It very rarely extends beyond the glandular apparatus, and on close examination is found to be deposited in the Peyer's and solitary sacculi, below the mucous membrane, and in the submucous tissue; in such a manner that the layer of the latter, which is next the muscular coat, is unaffected. The mesenteric glands in this stage are much swollen, vascular, and firm.

When the third stage sets in the congestion is again increased, the mucous membrane and especially the villi swell up, and, on pressure, give out a grayish-white, flocculent fluid:

" But the most remarkable alteration takes place in the typhous patches (*plaques*) and in the mesenteric glands; they become loosened. The patches swell still more, and when the process does not set in and go on in them uniformly they acquire an uneven, nodulated surface. The substance deposited in them is changed into a grayish medullary material, and undergoes one of two changes: either it is converted, together with the mucous membrane covering it, into a closely adherent, dirty yellow or brown slough, infiltrated with the feculent contents of the intestines, which then shrivels up, gradually separates from the margins around it, becomes rotten, splits in different directions, breaks off from the deepest layer of the submucous tissue, and in this way is at once or piecemeal discharged; or else it degenerates (and this with peculiar intensity in certain epidemics) into a loose, vascular, blueish-red, fungous tissue, permeated by streaky extravasations of blood, or infiltrated with blood, which is the source of profuse intestinal hemorrhages, and is cast off piecemeal without precedent sloughing. This metamorphosis, which goes on in the solitary as well as in the Peyer's glands, though later and more slowly, sometimes affects the whole patch almost uniformly, but sometimes only particular portions or single follicles, while the rest of the patch undergoes a retrograde metamorphosis by absorption, collapses, and leaves behind it a flaccid, succulent, wrinkled swelling of the plexus of glands.......... The mesenteric glands, which in general are always behind the intestine in their typhous metamorphoses, attain in this third stage their extreme size. They become as large as pigeons' eggs, and in the neighbourhood of the cæcum as large as hens' eggs, and form a knotted cord, extending obliquely from the end of the ileum to the lumbar plexus. They are blueish or brownish-red, very vascular, and often are the seats of extravasations of blood." (pp. 240-2.)

This stage completed, the proper typhous ulcer remains, which is distinguished by its elliptical, round, or irregular form, (according as the whole of a patch, or a few of its glands, or a solitary gland, or irregular portions have sloughed;) its position opposite the attachment of the mesentery, and with its long axis parallel to that of the intestine; its livid or gray, loose and free, elevated and overhanging margin; its base formed by a delicate layer of the deepest submucous tissue; and its chief seat nearest the ileo-cœcal valve. Such ulcers may heal; and their cicatrices have this singular character, that they never produce any narrowing of the intestinal canal. The mesenteric glands at the same time shrink to their natural volume, or below it.

Among the alterations of other organs in typhus, Rokitansky mentions a flaccidity and paleness or dirty redness of the heart; but that softness which is described by Dr. Stokes does not occur among his patients. Since 1824 he has often observed that,

" In the first stages of typhus the ganglia of the solar and superior mesenteric plexuses are in a state of turgescence with a blueish or grayish-red colour, and a looseness of texture; and that in the stage of ulceration and subsequently, they are collapsed, pale, flaccid, and not unfrequently in a remarkable degree withered, leathery, and tough, and of a dirty white or ash-gray colour." (p. 247.)

But these are only the general features of the local typhous process. It presents, in certain cases, remarkable anomalies both of *quantity* and of *quality*, as Rokitansky distinguishes them. In the anomalies of the former kind there may be only a diffuse congestion of the mucous membrane, or an imperfect development of the patches, with but a slight plasticity of the morbid product; or the latter may be absorbed, producing the " plaques à surface reticulée" of Chomel; or its metamorphosis may make slow progress. Or, when the local process is intense, there may be severe congestion of the mucous membrane, extending even to the peritoneum, and producing peritonitis, with unusual turgescence of the morbid product, and effusion of blood in the coats of the intestine; or there may be exuberant fungous growths or destructive hemorrhage; or, in other cases, the morbid product may spread far beyond its ordinary bounds.

Of the anomalies *in quality*, the most remarkable are those in which the cicatrization of the ulcers is much retarded (which may be due to a variety of causes), and those in which the ulcers go on to perforation, a result which, Rokitansky thinks, is brought about by a process quite different from that of the previous and proper typhous ulceration. The latter is the consequence of the metamorphosis of the peculiar morbid product of typhus which is never deposited so deeply as the muscular coat. That coat, therefore, is the proper boundary of the typhous ulceration, and when the ulceration spreads more deeply, the tissue attacked by it does not first become the seat of typhous deposit. And in this, the progress of the typhous is distinguished from that of the tuberculous, ulcer of the intestines, which makes progress, both in breadth and in depth, by the softening and ulceration of secondary deposits of infiltrated or granular tubercle in its margins and base. The progress of the latter to perforation is tuberculous throughout; that of the former is typhous only at its commencement.

Again, there are cases of qualitative anomaly in the typhous process, in which the progress of the affection of the mesenteric glands is much more acute than usual, producing peritonitis, or effusions of blood into the peritoneum, or fungous degeneration and breaking out of the substance of the glands.

Lastly, Rokitansky describes briefly what he calls the " secondary typhous processes," some of which he names *genuine,* others *degenerate.* Those of the former class comprise the repeated eruption of the disease in the small intestines, its appearance in the colon and stomach, the airpassages, the pharynx, the urinary bladder, serous membranes, and various organs, all of which he believes are, in these cases, the seat, not of accidental ordinary inflammation, but of the deposition of typhous matter, which passes through its usual changes. The *degenerate* class of secondary typhous processes includes those examples in which, instead of the usual metamorphoses of typhous matter, the morbid process imitates that of a simple, non-specific disease, assuming the characters of a fibrinous or croupous inflammation, of gangrene, suppuration, or purulent diathesis; " all of which," says Rokitansky, " are based on a corresponding degeneration of the typhus-process in the blood." (p. 254.)

Such is Rokitansky's account of typhus; of which, as he proposes to develop it further in another volume, we will merely say that its foundation, taken only as an hypothesis, may be amply sufficient for the explanation of all the structural phenomena of the disease; but that, as a statement professing to be fact, it needs further palpable and visible evidence. Especially, we want at present the proof of the existence of this typhus-material as something possessing an elementary structure, or composition, different from that of ordinary exudative products. Its metamorphoses are peculiar, but so are those of many substances which as yet we regard as merely fibrinous. There is great probability of truth in Rokitansky's view, but we repeat that perceptible evidence is wanting. Moreover, if it be admitted, we think that the typhous bears more analogy to several other peculiar processes than to that of encephaloid cancer; surely, for example, it is much more like that of the exanthemata.

From the typhous disease of the intestines, Rokitansky proceeds to the *Tuberculous* and *Carcinomatous.* His descriptions of both are complete and good; and under that of the latter he introduces what seems a favorite " theory of ileus from scirrhous degeneration of the intestine," which, at least in part, is similar to that of Dr. Abercromby, in which the retention is ascribed not to spasm but to paralysis, not to the contracted but to the dilated portion of the canal.

" The cancerous portion of the intestine is, quite independent of the degree of stricture, in a completely passive state, in consequence of the firm, morbid matter, deposited in the submucous cellular tissue, and, still more, through the degeneration of its muscular coat. The onward motion of the intestinal contents through it is therefore effected by the muscular energy of the part of the canal above it; and this energy will be the more intense the more considerable the stricture, the greater the extent (in length) of the degeneration (although there be no stricture), and the greater the mass to be moved on. In all cases the intestinal contents will frequently stagnate in the canal above the diseased portion, and there they will accumulate, and distend it. Now this distension produces either (when it rapidly passes beyond a certain proportion) immediate paralysis of the tube, or it produces reaction, by which as much as possible of the

contents is repeatedly forced through the diseased part; hence follows hyper-trophy, especially of the muscular coat, and after this, when the accumulation and distension increasing gain the ascendancy, gradual exhaustion and paralysis. And this paralysed portion of the intestinal tube has in it the proximate cause of the ileus which soon ensues.   As soon as the accumulation of the intestinal contents, continually passing into it, has become so great as to reach to that part of the canal above it which is still capable of contraction, this endeavours to force them on.   But its most energetic action has little effect, since it has to overcome, not only the masses accumulated in the paralysed portion of the canal, but also, beyond them, a stricture.   Under these circumstances the peristaltic motion becomes antiperistaltic, the intestinal contents are carried back to the stomach, and thence are discharged by vomiting." (p. 282.)

It is not difficult to apply this most ingenious and probable explana-tion of ileus from stricture to all the varieties of the disease, whether the paralysis be primary or secondary.

Affections of the liver and gall-bladder.   After this, Rokitansky de-scribes the diseases, or their varieties, peculiar to each division of the intestinal canal, and next the anatomy of the diseases of the liver, a sub-ject of which he, like all who know anything about it, confesses the ex-treme difficulty.   His description of the various appearances which they present is most complete and accurate; if we may so speak, his portraits are drawn to the very life; but still they are mere descriptions, of which neither an abstract nor a generalization can be made; and we must pass them over with no more than the assertion of our belief that there is not a man in Europe who will not be the wiser for having read them.

Under " Diseases of the Gall-bladder," the fact is pointed out that " in cases of obstruction of the ductus choledochus the dilatation gra-dually extends up the whole biliary apparatus, but the gall-bladder in such cases of even very remarkable dilatations, does not commonly pre-sent a proportional degree of distension, because the cystic duct, opening at an acute angle, is compressed by the dilated ductus chole-dochus" (p. 361); a circumstance of no small importance in the security which it affords against rupture of the gall-bladder.

He shows also how, after complete obliteration of the cystic duct, the gall-bladder acquires all the characters of a serous membrane, and be-comes liable to the same diseases.   " Especially, inflammations are not rare, which produce the most varied exudations, and lead to as different results.   Among the latter, a shrinking of the gall-bladder, with diminu-tion of its contents, and an inspissation of them into a fatty and calca-reous pulp and concretion, and then the ossification of its walls are par-ticularly to be remarked." (p. 363.)

Diseases of the spleen and pancreas.   Under this head there is much accurately described, but little from which definite conclusions can be drawn.   The descriptions of the diseases of the pancreas are more nu-merous and complete than those in any other work, but still scanty, and seemingly unimportant.   These, therefore, with which the section on the digestive apparatus is terminated, we pass by.

Affections of the urinary organs.   In the next chief section, he treats of diseases of the urinary apparatus, and again exhibits, in the midst of some obscurity of explanation, that remarkable power of recognizing and portraying differences and resemblances of mere appearance, which is the most striking feature of the work.   From this section, since the division

on the diseases of the kidneys is the only one presenting much novelty, we shall make a full, though but a partial abstract.

After passing briefly, in the plan adopted throughout the volume, over the anormal defects and excesses of development of the kidney, its deviations in size, in form, in position, and in consistence, and its solutions of continuity, he comes to that which here, as in other cases, constitutes the chief division,—the diseases of its texture. In these he places hyperemia and apoplexy, inflammation, Bright's disease, and morbid deposits. His account of the third of these is most worthy of notice; for though very complete, it is, we believe, as far as morbid anatomy is concerned, very true.

Bright's Disease. " Bright's disease appears in very different forms, which have relation partly to the degree and course of the disease, partly to its stage; and the first two of these circumstances are essentially connected with the degree of local reaction in the parenchyma of the kidney, and with the degree of morbid affection of the blood. We shall first point out the different modes of appearance of the disease as so many forms of it, then illustrate their combinations, their course, and their passage from one to the other in stages and degrees, and lastly, enter upon a general consideration of the disease." (p. 412.)

In this view Rokitansky arranges all the forms of this disease under eight varieties, of which we may say beforehand, that the first is peculiar, the next four are stages or modifications of the same general process, the sixth and seventh are peculiar, but related, and the eighth is a peculiar form, dependent on a peculiarity of the general diathesis.

" 1*st Form.* The kidney appears enlarged, swollen, and heavy: the cortical substance is almost uniformly infiltrated by a dirty, reddish-brown, turbid fluid, on which, as a ground colour, the blood-vessels present a darker, sprinkled, or streaky redness. Other similar red spots are produced by effusions of blood in the tissue. The pyramids present the same dark discoloration, with dirty, streaky redness. The whole tissue, but especially the cortical substance, is uncommonly brittle, and easily torn; and on its torn or cut surface a reddish-brown, thin, very finely flocculent, turbid, bloody, and somewhat sticky fluid oozes out. The whole organ is turgid and flaccid. The capsule is injected, infiltrated by the dirty, bloody fluid, and easily separated; the mucous membrane of the pelvis, &c. is reddened and loosened, and contains muco-sanguineous, turbid, urinous fluid.

" 2*d Form.* With an increase of size and weight as in the first, the tissue of the cortical substance appears either uniformly, or in certain undefined portions, infiltrated by a reddish, or yellowish-gray, or white, turbid, viscid fluid, from which it derives its characteristic colour, and which exhibits here and there an indistinct, punctiform, and linear arrangement. There is also a sprinkled or streaky redness, from injection or ecchymosis, which is the more striking the paler the infiltrated tissue is. Very often, the infiltration and bleaching of the tissue are complete in certain parts, while in others the hyperemia and ecchymosis preponderate; and this is the combination described by writers as a peculiar species, arising from partial anemia and hyperemia. The consistence of the organ is diminished, but less than in the first form. The capsule and mucous membrane are in the same state; and the pelvis, &c. contain a whey-like, turbid fluid, of a white colour, tending to yellowish or reddish. The pyramids commonly appear engorged, and therefore rather dark.

" 3*d Form.* Considerable increase in size and weight, complete anemia of the cortical substance, which is interrupted only by scattered stars, knots, and streaks of blood-vessels. The cortical substance is increased between five and nine lines in diameter; its surface is smooth and slightly glistening, it is turgid, friable, and filled by a great quantity of a milky, turbid, whitish or yellowish

fluid. Especially in the superficial layers, but in the deep ones also, it appears to consist of white or yellowish-white looser granules (Bright's granulations), varying in size between those of poppy-seeds and pins' heads; and towards the pyramids there are lines of the same substance. The pyramids are often compressed and separated from one another by the enlargement of the substance between them; and by the increase of that between their tubules, these are separated so that the bases of the papillæ seem fibrous or tufted. The capsule is very easily separated, swollen, and opaque; the mucous membrane reddened; the pelvis, &c. filled by a milky, turbid, viscid fluid.

"4*th Form.* Very considerable increase of size and weight; very considerable loosening of texture; the cortical substance is uncommonly turgid, and here and there feels almost fluctuating; its tissue is completely anemic, very easily torn, and filled by an unusual quantity of a milky-white, or yellowish juice. The granulations surpass the size of millet-seed; they are as large as hemp-seed; and, since this is especially the case in the peripheral layer, they project on the surface of the organ, and give it a glandular aspect. Sometimes a tumultuous enlargement of this kind affects certain portions of the kidney, and then an aggregate of these granulations projects, cauliflower-like, on the surface, so that the kidney becomes misshapen by unevenness and knot-like elevations. The granulations are very soft, and tear and break up under the slightest pressure of the finger. The capsule is almost loose; the cones are pale rose-red, or scarcely discernible; the pelvis, &c. are reddened, and contain a thick, creamy fluid.

" 5*th Form.* The kidneys are large, or of their normal size, or are more or less considerably diminished; their surface is granulated or glandular, or, together with glandular prominent portions, there are irregular parts deepened in fossæ, sunk-in and cicatrix-like. The cortical substance is coarsely granular, loose, very vascular, and full of blood, and the vessels are varicose; or, when the decrease of the size of the organ is great, the cortical substance is pale yellowish, very deficient in vessels and blood, hard, tough like leather, and for the most part of a dense, cellulo-fibrous texture; while here and there in the sunken fossæ on the surface there is a similar tissue, of a whitish or ash-gray colour. Moreover, one often sees in the cortical substance sacculi of various size, and full of different fluids. When the kidney is large the capsule is loosely, when small very closely, connected. In the latter case it is thickened, and the fat around it is condensed. The cones are small, dense, and for the most part dirty-brown. The calyces and pelvis somewhat shrivelled.

" 6*th Form.* With an unimportant increase of size and weight the cortical substance appears, in certain indefinite situations, either uniformly pale-reddish, or else (especially on close examination) of a mixed and confused pale red and whitish, or yellowish faint hue; it is infiltrated by a consistent substance like a thick cream, or coagulated albumen, and exhibits not only no loosening of its texture, but either its normal consistence or a much greater toughness. The capsule is slightly loosened; the pyramids, calyces, &c. are healthy.

" 7*th Form.* For the most part an unimportant enlargement, sometimes a partial shrinking; increase of density and consistence. The cortical substance, in certain undefined and sometimes large portions, is pale, and of a dull-white colour, from a coagulated albuminous or apparently fibrinous substance, in which the renal tissue is altogether suppressed. The kidney at these parts is swollen by the morbid substance deposited in it, or else it appears shrunken, from the substance having acquired a cartilaginous aspect and resistance. One or more of the cones sometimes exhibit a similar metamorphosis. The capsule is thickened, and firmly adherent to the diseased portions; the pelvis and calyces are swollen.

" 8*th Form.* The kidney is seldom importantly, but usually somewhat, enlarged, and, though it be of its normal size, is always remarkably firm. With a dirty-reddish or yellow-leather colour, the cortical substance appears of a waxen lustre, uncommonly hard and brittle, and is infiltrated by an albumino-

fibrous substance. Sometimes one sees a whitish, flocculent material, in the form of finely granular points and lines deposited in the tissue, from which the surface as well as the section acquires a marbled aspect." (pp. 413-17.)

Such are the forms of this important disease which Rokitansky believes must, in a general view, be enumerated. It was the more important to make this long extract, because at this time, when minute researches are being made into the subject, it is desirable that the general aspect of the morbid changes, in all their varieties, should be well known. It is absurd to talk of one microscopic character in a diseased structure which has at least eight gross forms; or to suppose that the finding of one kind of minute change will explain the pathology of this disease, more than the finding of pus-globules explains all the varieties of suppuration or ulceration.

Of these eight varieties, Rokitansky continues, the first seven are proved, by the phenomena observed during life in connexion with them, to belong to the Bright's disease. The first is extremely rare: the changes described are found in cases which have run a most acute course, destroying life, perhaps, in fourteen days. The second, third, fourth, and fifth, constitute the genuine Bright's disease, and Christison's Granular Degeneration,—a chronic, though often aggravated and accelerated affection, in which the first three of these forms are produced in successive stages, in either of which death may ensue, and in which the fifth form is the last member in the series, and indicates a retrograde process in the damaged tissue, *a secondary atrophy*. These four forms, or any two of them, moreover, may be found together, in one or both kidneys; and the disease in the cortical generally takes the lead of that in the deeper substance. The sixth and seventh are genuine chronic forms, the latter being the end of the metamorphosis, the product of the diseased process becoming condensed and organized, and shrinking up. The eighth form is also always chronic, occurring in inveterate scrofula, rickets, &c., and especially in the cachexia of syphilis and mercurial disease, and usually coinciding with infiltrations of similar substances in other organs. The essence of the disease is inflammatory:

" A process of inflammation, after hyperemia, deposits in the stage of *stasis*, a product which is not only distinguished by its peculiar nature, but which also, in the genuine cases, by its excessive accumulation, alters in a peculiar manner the aspect and the texture of the kidney. It is for the most part chronic, with occasional exacerbations; but sometimes is acute, and it is in these important cases, in which, in consequence of the rapid process of exudation, the product mixed with a great deal of serum, is not yet coagulated into the milky or creamy substance characteristic of Bright's disease, and is for the most part coloured by blood, that one would be obliged to regard the condition as a very acute simple inflammation of the kidneys, if the general phenomena and the state of the urine did not set the peculiar nature of the disease beyond a doubt." (p. 419.)

He believes that the product is deposited in every part of the tissue external to the vessels, but especially in the corpora Malpighiana; (but this, we think, not from personal observation;) that its peculiarities depend on a peculiar morbid condition of the blood " consisting in an excess of albumen, perhaps based on a *depotentiation* of the fibrine;" that the albumen in the urine is due to its discharge with the excretion coincident with its deposit in the tissue, the dropsy to the attenuation of the blood. The disease may get well in any of its stages by resolution; but

far more commonly it goes on to granulation, induration, and atrophy. But on all these questions the information is meager.

From the rest of this section we find only scattered observations worth noticing; but these are not a few:

" *The dilatations of the ureters* induced by obstruction and accumulation of urine, are often favoured by an inflammatory state of their mucous membrane paralysing their contractile external layer." (p. 436.)

" *Dilatation of the pelvis of the kidney*, in a very remarkable case which fell under our observation, was the consequence of the pressure exercised by a branch of the renal artery passing in an arch from the upper end of the hilus to a branch lower down, and crossing over the pelvis at its passage into the ureter." (p. 438.)

" *The occurrence of cysts in the pelvis* and ureter appeared to be frequent, when compared with their existence in or on other ducts, and therefore deserves remark. They are cysts varying in size from that of grains of sand to that of peas which are developed under the mucous membrane, either singly or in groups, which contain either a colourless or yellowish serous fluid, or with this a soft, gelatinous, or hard, amber-like, horny lump, of various size, and which, moreover, occasionally bursts, together with the mucous membrane, over them ; so that concretions of the same kind are occasionally found in the urinary bladder. They were situated, in the two cases observed, chiefly in the ureters ; in one of them in the pelvis and calyces also." (p. 442.)

" *Primary croupous (fibrinous or plastic) inflammation of the mucous membrane of the bladder* is indeed one of the rarest of appearances, but exudative processes in the form of secondary affections are not so rare as is commonly believed. They occur in the course of exanthematous diseases, especially of variola and scarlatina, in the course of typhus as the expression of an anomaly and degeneration of the proper process, in consequence of the passage of pus into the blood, and in company with exudative processes on other mucous membranes. . . . .

" *The typhous process on the mucous membrane of the bladder* occurs, 1st, very rarely in a genuine form, that is, characterized by a product like that which it deposits, especially in the intestines and mesenteric glands ; 2d, very frequently degenerated into an exudative process, particularly in the form of scattered, insular, soft exudations; and, 3d, degenerated into an exudative process, of the nature of a slough. But the disease generally proves fatal too soon for us to have an opportunity of observing the progress of these products." (p. 456.)

" *Tubercle* very rarely occurs on the mucous membrane of the bladder. . . . . It is usually associated with tubercle of the urethra and prostate. It always appears in the form of discrete granulation, which is deposited in and beneath the mucous membrane with more or less of reaction and development of vessels, which softens more or less rapidly, breaks through the mucous membrane within a circle of vessels, and forms a small, roundish ulcer. Secondary tuberculous deposits and secondary enlargements of the tuberculous ulcer occur but very rarely." (p. 458.)

The section is concluded by a brief account of the anormal characters of the urine, and of the deposits and concretions formed in it.

Affections of the sexual organs. The section on the diseases of the male organs, like all those on affections in the province of surgery, is very incomplete. The only passage worth quoting is on

" *Inflammation of the vesiculæ seminales.* One has not unfrequently occasion to observe in the dead body a *chronic catarrh* and its consequences, consisting in swelling with relaxation of the mucous membrane, secretion of a grayish or yellowish puriform mucus, dilatation and, at last, thickening of the walls of the seminal vesicles. In rare cases one finds, after suppuration of the mucous membrane, that the affected parts are covered by a whitish or ash-gray lattice-

work of a fibro-cellular texture, their walls very considerably thickened and brawny, their canal narrowed and obliterated. With equal rarity this inflammation degenerates into an ulcerative perforation of the seminal vesicles, the formation of depôts of pus in their cellulo-fibrous nidus, and even into destruction of a convolution and the laying open of two contiguous canals. The chronic catarrh occurs, especially in old age, in consequence of the mechanical hyperemia of the pelvic venous plexuses, ... together with catarrhal states of the bladder after repeated gonorrhœa, excessive venery," &c. (p. 490.)

Diseases of the female organs. The section on this class of diseases, unlike the preceding, is very complete. One of its most interesting parts is that in which Rokitansky discusses at great length his favorite subject of the unicorn, bicorn, and bilocular malformations of the uterus; all of which he clearly shows to be dependent on different degrees of defect in the development and coalition of the two lateral halves of which the ultimately single organ is originally composed. The unicorn uterus he shows is one in which one half only of the organ has been developed; the bicorn, one in which both halves are developed, but have not coalesced so completely or so high up as they should; the bilocular, one in which the coalition is nearly complete externally but imperfect internally. But between these states there are various intermediate degrees, depending on the extent of coalition, and the inequality of the development of the two halves; for though both halves may be developed, yet one may be much less so than the other, and may appear as a mere rudiment of a uterine horn attached to the side or fundus of the more perfect half. Of this last case he mentions a very remarkable example:

" There is in our collection an example of pregnancy in a rudimental uterine horn, which proved fatal in the third month by rupture and effusion of blood into the peritoneal sac. The case had been regarded as one of Fallopian pregnancy, till a recent examination of it led me to another view............... The true uterus is a unicorn uterus of the left side, with a vaginal portion in which one may perceive signs of former gestations; from its extremity, which is arched towards the left, proceeds the left Fallopian tube. Into the convex right border of this uterus there sinks a flattened hollow cord, composed of uterine tissue, with tolerably thick walls, the cavity of which opens by a narrow aperture into the cavity of the true uterus. This cord is more than two inches long, and externally is enlarged into a sac, from the outer end of which there proceeds a (right) Fallopian tube, which has its ovary, and below it a round ligament. The sac contains a female fœtus, of three months, with its membranes,............ and is burst near the insertion of the umbilical cord. The left half of the uterus is twice as large as in the unimpregnated state, and thickly walled; its inner surface, as well as that of the canal opening into it, is lined by decidua, and its cervix is filled by a plug of jelly. The parts were taken from a girl twenty-four years old............ Four pints of blood had flowed from the ruptured sac into the abdomen." (p. 519.)

Cases of this kind prove the possibility, and even the probability of superfœtation occurring in the subjects of the malformation. And many of the cases which Rokitansky has observed confirm Meckel's observation, that women with uteri thus formed are peculiarly liable to die in gestation and after delivery; whether from defective power of the half uterus, or from the hindrance produced by the simultaneous enlargement of the unimpregnated portion, or by the oblique position of the part in which the fœtus lies, or from the defective supply of blood to the impregnated part, a large portion of that which is sent being appropriated by the enlarged unimpregnated part.

Under the organic affections of the uterus Rokitansky says, in explanation of—

" *Hydrometra, or uterine dropsy.* In consequence of inveterate uterine catarrh, strictures and closure of the cavity not unfrequently take place, and from these, when the catarrh continues, dilatations of its cavity and cervix. In the further course of a dilatation thus continuing, one sometimes observes in the uterus that alteration in its texture and function which occurs under similar circumstances and produces dropsy of other mucous canals and cavities, as of the gall-bladder already mentioned. The mucous membrane of the uterine cavity, stretched by the accumulating secretion, becomes gradually a thin serous membrane, which secretes a colourless, serous, albuminous, synovia-like fluid. The uterus is changed into a round, pretty-thickly walled, dropsical capsule, as large as an egg or a fist ; a state which alone properly deserves the name of *hydrometra*............ The fluid may, through disease of the lining membrane, be variously changed, or may be partially discharged through the vagina, and accumulate again." (p. 536.)

Among the changes which the uterus may undergo in consequence of the development of fibrous tumours, he mentions as the most important the elongation produced by the growth of many tumours, and their being carried upwards out of the pelvis ; and adds :

" The uterus thus becomes thinner : nay, in rare cases the atrophy is carried to such an extent that the uterus slowly suffers a solution of continuity ; one portion of it remaining attached to the vagina, while the other is dragged upwards till the two are connected only by a cord of fibro-cellular tissue." (p. 547.)

A section is devoted to the *diseases of the impregnated uterus and of the puerperal state.* Those of the latter cannot be well described in an abstract ; nor, except in its completeness, does his account of them present much that is novel. The following, however, is certainly not generally known :

" A very remarkable and, from its dangerous nature, a very important state, which may be recognized even in the dead body, is that of a paralysis of the portion of the uterus on which the placenta is implanted, while the part around it has undergone its normal changes. It presents a peculiar appearance. The situation of the connexion of the placenta is pressed in towards the cavity by the surrounding contracting tissue, so that it projects in the form of an arched tumour, while externally one observes on the corresponding part a shallow inversion of the uterine wall. One is easily induced by a deceptive resemblance to regard the paralysed section of the uterus as a fibrous polypus, and only an accurate examination of its tissue can afford a decided conclusion. The disease induces exhausting hemorrhages, which continue even for several weeks after delivery, and thus proves fatal. We have seen it twice—once after an abortion and once after delivery at the full term ; and probably other cases are recorded." (p. 556.)

From the diseases of the Fallopian tubes, ovaries, and mammary glands, which close this section, Rokitansky proceeds to *diseases of the ovum and fœtus,* of all of which he gives a complete, though necessarily brief, sketch, and thus concludes the volume. In the course of our analysis of it we have said enough of its defects, and comparatively little of its merits. The best evidence of the latter is found in the length to which this abstract has been carried without passing beyond the bounds of what is novel or important. Nor would that fault have been committed though much more had been borrowed. No modern volume published on morbid anatomy contains half so many genuine facts as this : it is alone sufficient to place its author in the highest rank of European medical observers.

Art. VIII.

De Herophili Celeberrimi Medici Vita, Scriptis, atque in Medicina Meritis. Auctore Car. Frid. Henr. Marx.— *Gottingæ*, 1840. 4to, pp. 60.

In a recent Number of our Journal, after expressing some surprise that the name of Professor Marx was not better known in England, we gave some account of his work on Paracelsus, which probably no man in Europe could have written but himself ; and if we cannot say quite so much for that which we are now about to notice, we may at any rate safely affirm that no man in Europe could have executed it better. It belongs to a very useful class of monographs, which serve to throw great light upon particular periods of the ancient history of medicine, and which are not uncommon in Germany,* though in England they are almost unknown.† Except the very highest names in ancient medical history, perhaps few are better known in England than that of Herophilus. Probably every one has a vague idea that he was a great anatomist, and recollects meeting with his name, when he was a medical student, in his " Elements of Anatomy" and in Celsus. More than this is not so generally known ; and therefore we gladly take the opportunity of giving an analysis of Professor Marx's work, and of thus helping to revive the fame of one who held (according to Fallopius ‡) the same place among the ancients as Vesalius among the moderns, and whose authority in anatomy was equal to that of the Gospel in religion. Before doing this, however, it may be as well to give some slight sketch of the state of anatomy before his time, and to notice the dates and authors of the principal discoveries in that branch of medical science. The earliest improvements seem to be due to the Pythagorean philosopher, Alcmæon, who (in the sixth century before Christ) was the first person who ventured upon systematic dissections,§ instead of resting content with such imperfect glimpses at our internal structure as might be gained from the casual inspection of victims offered in sacrifice, the dressing of wounds, &c. Whether he merely confined himself to the dissection of animals, or whether he so far anticipated the improvements of a later age as to dissect human bodies is uncertain ; ‖ but we have reason to believe that the *Eustachian tube* was first observed

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* Of these we may mention two or three of the best, as they may, perhaps, be new to some of our readers : " Asclepiadis Bithyni Fragmenta digessit et curavit Christ. Gottl. Gumpert, præfatus est Christ. Gothfr. Gruner," Vinariæ, 1794, 8vo ; " Antylli, veteris chirurgi, τὰ λείψανα ventilanda exhibet Panagiota Nicolaides præside Curtio Sprengel," Halæ, 1799, 4to ; C. G. Kühn, " De Praxagora Coo," in the second volume of his *Opuscula Academica Medica et Philologica*, Lips. 1827-8, 2 vols. 8vo.

† The only English work of this kind that we are aware of is Dr. Milward's *Trallianus Reviviscens*, &c. Lond. 1734, 8vo.

‡ *De Mater. Medicin. in lib. i. Dioscor.* c. 1, tom. i. p. 25, ed. Francof. 1600. See, also, *De Part. Simil.* c. 12, 13. tom. ii. p. 129, 132.

§ Chalcidius, *Comment. in Platon. " Timæum,"* p. 340. ed. Meurs.

‖ The word *exsectio*, used by Chalcidius, seems to be equally applicable to human and comparative anatomy, implying merely *dissection* generally, that is, as it was usually carried on in the time of the writer. If this be true, *exsectio* will here certainly imply the dissection of animals ; and, indeed, we might naturally expect some more precise and positive expression, if the human body were meant. Alcmæon's Pythagorean prejudices would be equally shocked by the touch of the dead body of a man or an animal.

by him,* and that in physiology he advanced far beyond his predecessors.
The cochlea of the ear,† and the amnios of the fœtus,‡ owe their names
to Empedocles, of Agrigentum, who probably first described them, in the
fifth century before Christ. Omitting Anaxagoras and Democritus, whose
anatomical labours and speculations furnished no results of sufficient im-
portance to be particularly noticed here, we next come to Hippocrates,
the amount of whose knowledge in this (or indeed any other) branch of
medical science, it is not easy to determine. For, supposing the prelimi-
nary question, " Did Hippocrates ever really exist?"§ to be satisfactorily
answered in the affirmative, we find ourselves at once involved in the
much more difficult inquiry as to which, of all the numerous treatises
that go under his name, were really written by him. These difficulties,
however, in the present instance, need not occupy our attention, as we
are not aware of any great anatomical or physiological discovery con-
nected with the name of Hippocrates, and this is certainly one of the least
valuable parts of the Hippocratic collection. The nerves seem to have
been first distinguished from the tendons by Aristotle,‖ who also affirmed
that the brain of man is larger than that of any other animal,¶ and who
was the first person who restricted the term *aorta* to the great artery of
the body.** Praxagoras, the tutor of Herophilus, is generally supposed
to have been the earliest author who distinguished between the arteries
and veins, though the honour of this discovery is doubted by Kühn.††
During all this time (and indeed much later) the greatest laxity and con-
fusion prevailed in anatomical language, which of course greatly adds to
the difficulty of determining the exact amount of knowledge possessed
by the ancients in this branch of medical science. A few instances will
be sufficient to prove this. The word φλὲψ was originally applied to both
the veins and arteries,‡‡ the latter being sometimes called φλέβες σφύζουσαι,
or *pulsating veins;* on the other hand, ἀρτηρία in the oldest writings
always means the *trachea;* and when in process of time the word was
used in a more extended sense, so as to include the *arteries*, the former
was called τραχεῖα ἀρτηρία, or *the rough artery*, while the latter were dis-
tinguished by the epithet λεῖαι, and were called *the smooth arteries*.
Again, not only before the time of Aristotle, but even after the distinction

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* This we learn, curiously enough, from Aristotle, who says (*Hist. Anim.* i. 9. § 1,)
that Alcmæon was wrong in affirming that goats breathe through their ears. This strange
assertion can only be accounted for by supposing that he had observed the canal leading
from the anterior and inner part of the tympanum to the fauces; and, if we imagine that,
in the animal which he dissected, the membrana tympani had been accidentally destroyed,
his mistake may be easily and naturally explained.

† Κοχλιωδὴς χόνδρος. Plutarch. *De Phys. Philosoph. Decretis*, lib. iv. c. 16.

‡ Julius Pollux, *Onomast.* lib. ii. § 223; Rufus Ephes. *De Hum. Corp. Part. Appellat.*
p. 45. ed. Clinch.

§ M. Houdart (p. 23) commences his *Etudes sur Hippocrate* by this question, which,
however, he confesses to be " la plus complète des absurdités."

‖ He calls the nerves πόροι. *Hist. Anim.* lib. iv. c. 8. § 2, *et passim.*

¶ *Hist. Anim.* lib. i. c. 13. § 2.

** *Hist. Anim.* lib. i. c. 14, § 3; iii. 3, § 1. Before his time the word was applied
both to the other arteries of the body indiscriminately (Rufus Ephes. *De Corp. Hum. Part.
Appellat.* p. 42), and also to the bronchia (Ruf. Eph. *ibid.* p. 37; Julius Pollux, *Onomast.*
lib. ii. c. 4, § 205; Hippocr. *De Locis in Hom.* tom. ii. pp. 123, 124. ed. Kühn).

†† *Comment. de Prax. Coo*, in his *Opusc. Academ. Med. et Philolog.* tom. ii. p. 136, seq.

‡‡ See the notes on p. 106, l. 14, and p. 257, l. 1, of the Oxford edition of Theophilus
De Corp. Hum. Fabrica.

between the *nerves* and *tendons* had been established, the word νεῦρον continued to be used in a very vague and indefinite way, so much so that in later times it was defined to mean a white, dense body,* of which there are three species, viz., those arising from the brain and spinal marrow, which are properly called *nerves;* those from the muscles, or *tendons;* and those from the bones, or *ligaments.* Several other instances might be mentioned in which the sense given by modern authors to Greek and Latin anatomical terms (and the remark might be extended, though in a less degree, to other branches of medical science,) is so different from the meaning of the words as used by the Greek and Latin writers themselves, that any one, who was not aware of this, would be constantly liable to be misled, and to attribute to the ancients ignorance and blunders of which they are wholly innocent. After these few remarks on the state of anatomical science and language before the time of Herophilus, we may now proceed to give an analysis of Professor Marx's life of that celebrated man.

We do not possess any detailed ancient account of Herophilus, and must therefore be content to glean all our information respecting him from such stray hints and expressions as we can meet with. He appears to have been born at Chalcedon, in Bithynia,† and to have lived in the time of Ptolemy Soter, b. c. 323-283, though the exact year both of his birth and his death is unknown. He was one of the pupils of Praxagoras, and afterwards settled at Alexandria, which city had been lately founded by Alexander, and was rapidly rising into eminence under the enlightened government of the first Ptolemy. Here he soon acquired a great reputation, and was one of the first founders of the medical school in that city, which afterwards eclipsed in celebrity all the others, so much so that in the fourth century after Christ the very fact of a physician's having studied at Alexandria was considered to be a sufficient guarantee of his ability. (Marx, p. 8.) Connected with his residence here, there is rather an amusing anecdote of his proving to a Sophist the possibility of motion, in a way probably more convincing than even Aldrich's famous " solvitur ambulando!" It appears that the philosopher used to deny the existence of motion, and to support his assertion by the following dilemma,—the fallacy of which, by the way, it is much easier to see at once than to explain :‡ " If matter moves, it is either in the place where it is, or in the place where it is not : but it cannot move in the place where it is, and certainly not in the place where it is not ; therefore it cannot move at all." He happened, however, to dislocate his shoulder, and sent for Herophilus to replace it, who first began by proving by his own argument that it was quite impossible that any luxation could have taken place ; upon which the unhappy sophist begged him to leave such quibbling for the present, and to proceed at once to his surgical treatment. (Marx, p. 6.) He seems to have given his chief attention to anatomy, which he studied not

* Pseudo-Galen, *Defin. Med.* c. 76, tom. xix. p. 366. ed. Kühn. See the note on p. 204, l. 5, of Theoph. *De Corp. Hum. Fabr.*

† His biographers " vie with each other" (as Porson would say,) in correcting and explaining the mistake in the text of Galen, *De Usu Part. Corp. Hum.* lib. i. c. 8, tom. iii. p. 21, where Καρχηδονίῳ is found instead of Χαλκηδονίῳ. Dr. Marx has committed a slight oversight in his quotation from Strabo, where he says that Chalcedon was Μαγνησίων κτίσμα : it should be Μεγαρέων.—Isensee says (*Gesch. der Med.* p. 87,) that Herophilus " ward zu den letzten Sprösslingen der Asclepiaden gerechnet;" but we do not know where he finds this, except in the *Biographie Médicale.*

‡ See Whately's *Logic,* pp. 371, 372.

merely from the dissection of animals, but from that of human bodies, as
is expressly asserted by Galen. (Marx, p. 25.)   The famous story of his
dissecting criminals alive it seems difficult to disbelieve, though most of
his biographers have tried to explain it away, or to throw discredit on it;*
for (not to lay much stress on the evident exaggeration of Tertullian, who
says that he dissected as many as six hundred,) it is mentioned by Celsus
quite as a well-known fact, and without the least suspicion as to its truth;
added to which, it should be remembered that such a proceeding would
not be nearly so shocking to men's feelings two thousand years ago as it
would be at present.†   He was the author of several medical and anato-
mical works, of which nothing but the titles and a few fragments remain.
Almost all of these have been collected by Professor Marx with remark-
able diligence and accuracy, so that he has left us little to do except to
make a few additions (chiefly from Greek authors published since the first
appearance of his work in German, 1836), and to correct one or two
errors, in doing which we would beg our readers to remember (as we hope
to bear in mind ourselves,) Galen's most excellent confession, that " it is
difficult for a mere man to avoid making many blunders, some from sheer
ignorance, others from a fault of judgment, and others from carelessness."‡
The first work attributed to Herophilus by Professor Marx is entitled
Περὶ Αἰτιῶν, *De Causis*, which is done on the authority of a manuscript
of Apollonius Citiensis, quoted by Cocchi in his *Discorso dell' Anatomia*,
Firenze, 1745, 4to, p. 80.   Cocchi's work we have never seen,§ and have
therefore been unable to verify the reference; but if (as we are pretty sure,)
the passage referred to be the same with that which is afterwards quoted
(p. 58,) from Dietz's *Scholia in Hippocr. et Gal.* tom. i. p. 34, it does not
seem quite clear to us that the work *De Causis* was written by Herophilus.
The passage stands thus: Θαυμάζω δὲ ἐπὶ τοῖς τὴν πολυθρύλλητον ἀνα-
τομὴν ἐναγκαλιζομένοις Ἡροφιλείοις, μάλιστα δὲ ἐπὶ Ἡγήτορος· ἐν γὰρ τῷ
Περὶ Αἰτιῶν περὶ μηροῦ ἐξαρθρήσεως οὕτως ἐμέμνητο τὰ ὑποτεταγμένα
διασαφῶν· which Professor Marx translates as follows: "Apollonius
initio inquit, se mirari Herophileos, percelebratam anatomen amplex-
antibus, maxime vero ipsorum ducem, qui libro *De Caussis* de femore

prolapso sic memoraverit." Now the difficulty is, to decide whether
'Ηγήτωρ is a proper name, or whether it is merely a sort of honorary title
applied to Herophilus, in the same way as we know that Alexander
Aphrodisiensis was called, *par excellence*, ὁ ἐξηγήτης, " the Interpreter,"
on account of the celebrity of his commentaries on Aristotle. In the
present instance, Dietz considers 'Ηγήτωρ to be the name of one of the
physicians of the Herophilean school (Pref. p. viii.), and prints it, accord-
ingly, with a capital letter; while Dr. Marx, as we have seen, takes it in
the other way. " Who shall decide when *Doctors* disagree?" and not
merely German doctors, but English scholars and doctors also, for it is
not by our own unassisted wisdom that we have come to a decision on
the subject. The result, however, of our deliberations is, that Dietz is
right, and Dr. Marx is wrong, and for these reasons :—We find 'Ηγήτωρ
mentioned three times by Apollonius (pp. 34, 35, 41), and in only one
of these passages is the article prefixed, whereas if it were a designation
of Herophilus it could not be used in any instance without it. Then,
again, as it is clear * that the writer did not himself belong to the sect of
the Herophileans, but was, on the contrary, much opposed to it, it seems
hardly probable that he should apply such an honorary title to their
founder. It is true that (as far as we are aware,) no mention of a physician
of this name occurs elsewhere ; but this objection will tell with equal force
the other way, for where do we find Herophilus called ἡγήτωρ by any
other writer ? If it be doubted whether 'Ηγήτωρ is ever found as a proper
name, we would refer to the new Paris edition of H. Stephens's Greek
Thesaurus, where a mathematician of that name is mentioned. If the
above remarks be correct, it will appear that Hegetor, and not Herophilus,
is the author of the work *De Causis*.† The other works of Herophilus,
whose titles are mentioned by Professor Marx (p. 12, seq.), are: *Ana-
tomia ; Disquisitiones de Pulsu ; Curationes ; Commentarius in Hippo-
cratis " Prognostica ;" De Oculis ; Diætetica ; ‡ Explicationes Dictio-
num Exoletarum Hippocratis ; Commentarius in Hippocratis "Apho-
rismos ;"* to which may be added one, *Contra Opiniones Vulgares*,
Πρὸς τὰς Κοινὰς Δόξας ;§ and another, *De Arte Obstetricia*, Μαιωτικὸς
[Λόγος].‖

We now come to the most interesting part of Dr. Marx's work, viz.,
the collection of the medical opinions of Herophilus, as far as they have
been handed down to us, and of these we shall try to give an analysis,
selecting only those which may be most likely to interest our readers
either for their novelty, their truth, or perhaps their strangeness. He
owes his principal celebrity (as we have before observed,) to his anatomical
researches and discoveries, and several of the names that he gave to dif-

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* See Dietz's Preface, p. viii.

† Since writing the above we find that M. Littré, in the introduction to the first volume
of his Hippocrates, p. 94, (which we are almost ashamed to confess we had not read
sooner,) considers 'Ηγήτωρ to be a proper name, and that he is the same person who is
mentioned by Galen (*De Dignosc. Puls.* lib. iv. c. 3. tom. viii. p. 955,) in company with
several other Alexandrian physicians.

‡ Dr. Marx conjectures (p. 13,) that a work ascribed to " Hierophilus Sophista,"
entitled *De Diæta et de Facultatibus Alimentorum*, may possibly be a part, or the whole,
of this work of Herophilus ; the short treatise, however, on this subject by Hierophilus
Sophista, which has lately been published by Ideler in the first volume of his *Physici et
Medici Græci Minores*, Berol. 1841, 8vo, is evidently the work of a much later author.

§ Quoted by Soranus, *De Arte Obstetr. Morbisque Mulier.* c. 8, p. 21. ed. Dietz,
Regim. Pruss. 1838, 8vo.   ‖ Quoted *ibid.* cc. 48, 93, pp. 100, 211.

ferent parts of the human body remain in common use to this day. He
was intimately acquainted with the nervous system (Marx, p. 27, seq.),
and seems to have recognised the division of the nerves into those of sen-
sation (αἰσθητικά), and those of voluntary motion (προαιρετικά); though
he included the tendons and ligaments under the common term νεῦρον,
and called some at least of the nerves by the name of πόροι, *meatus*.
(Marx, p. 30.) Whether the common point to which the sinuses of the
dura mater converge, corresponding with the internal occipital protube-
rance, to which we now give the name of "Torcular Herophili," be the
exact spot which Herophilus himself meant to designate by the term ληνός,
it is almost impossible to decide: Vesalius confessed the difficulty just
three centuries ago, Dr. Marx (p. 28) does the same, and we must fol-
low their example.* He distinguished the cerebrum, ἐγκέφαλος, from the
cerebellum, παρεγκεφαλίς, though he does not seem to have been the first
person who did so, as the two words are found in Aristotle.† He placed
the seat of the soul (τὸ τῆς ψυχῆς ἡγεμονικόν) in the ventricles of the brain
(Marx, pp. 29, 37), and thus probably originated the idea which was
again brought forward with some modification, towards the end of the last
century, by Sömmering.‡ The angular indentation in the posterior part
of the medulla oblongata derived the name of "calamus scriptorius" from
him (Marx, pp. 5, 30), on account of its similarity (not to the Roman
stilus, but) to the reed (κάλαμος,) used sometimes by the ancients as a
pen for writing, of which the best sorts came from Egypt and Cnidos,§
and with which he would naturally therefore be well acquainted. He
carefully described the tunics of the eye, and was the first to designate
them by peculiar names (Marx, p. 30, seq.), though what is exactly sig-
nified by each of these is a minute and difficult question, which perhaps
the generality of our readers would not care to see fully discussed in these
pages.|| He remarked the difference in the substance of the coats of the
veins and arteries, and said that the latter were six times as thick as the
former (Marx, p. 31). To the pulmonary artery he gave the name of
the *arterial vein* (φλὲψ ἀρτηριώδης), as being of an arterial structure,
while its contents were venous. He appears to have doubted whether
(as was universally believed among the ancients,) the veins were derived
from the liver, and to have been very near anticipating Aselli in his dis-
covery of the *lacteals* (Marx, p. 32). The *duodenum* derives its name
from him, being called δωδεκαδάκτυλος ἔκφυσις (which the Germans translate
more literally than the Latins, and call *zwölffingerdarm*) from being about
twelve fingers in length.¶ Our readers will perhaps excuse our entering

* Theophilus (*De Corp. Hum. Fabr.* lib. iv. c. 5, § 5,) seems (as is observed in the
Oxford edition,) to confound the *torcular* with the *infundibulum*. The passage is not
noticed by Professor Marx.

† *Hist. Animal*, lib. i. c. 16, § 3. ed. Bekker, Oxon. See Caspar Hofmann's *Comment.
in Galen. "De Usu Part.,"* § 636, quoted in the Oxford edit. of Theophilus, p. 134, l. 9.

‡ See his treatise, *Ueber das Organ der Seele*, § 26, 28. Königsberg, 1796, 4to.
(Marx, p. 38.)

§ See Pliny, *Hist. Nat.* lib. xvi. c. 64; Martial, *Epigr.* lib. xiv. ep. 38.

|| We agree, however, with Isensee (*Gesch. der Med.* p. 88), in thinking that Dr. Marx
is probably wrong if he supposes (as he seems to do, p. 31,) that the χιτὼν ἀραχνοειδής
in Rufus Ephesius, p. 36, means the *tunica humoris vitrei*, or *hyaloid membrane*, as the
retina appears to us to answer best to the description. Any one who is curious on the
subject may refer to the notes in the Oxf. edit. of Theophilus, on p. 159, l. 6, and p. 164, l. 7.

¶ See Theophilus, *De Corp. Hum. Fabr.* lib. ii. c. 7, § 10; a passage which appears
to have escaped Professor Marx's search.

minutely into the opinions of Herophilus respecting the organs of genera-
tion, on account of the uncertainty that prevails concerning the meaning
of some of the terms in use among the ancients, an uncertainty which
(it may be remarked) is increased in each particular instance, by our not
feeling quite sure whether it arises from *their* imperfect or erroneous de-
scription of the part, or our own dulness.   The female organs he is ex-
pressly said by Galen to have studied in the human subject, and accord-
ingly he particularly noticed the different appearance presented by the
os uteri in its natural state, during menstruation, and during pregnancy.*
He was also acquainted with the *Fallopian tubes*, and the *ovaries*,
which latter organs (in order probably the better to preserve the analogy
between the two sexes) he called *the testicles* (Marx, p. 36), a name
which, we believe, continued in use till quite modern times.   His opinion
concerning the *umbilical vein* and *arteries* (which we find in Soranus)†
seems to contain a singular mixture of truth and error.   He followed
Aristotle, ‡ in supposing that there were *two* umbilical veins as well as two
arteries,§ composing the placenta ;|| of which the former terminated in
the vena cava, and the latter in the trachea, after first turning off to each
side along the bladder.¶   Whether, in this case, Herophilus confused the
trachea with the aorta, or whether Soranus (or his transcriber) has mis-
taken his opinion, seems doubtful ; though, if the blunder really be
Herophilus's own, it is a strange instance of carelessness or ignorance, as
Aristotle expressly says that the umbilical arteries join the aorta, where
it subdivides into two branches.**

The opinions of Herophilus on pathology, dietetics, diagnosis, therapeu-
tics, materia medica, surgery, and midwifery, are collected by Dr. Marx with
equal care, but need not be here analysed so minutely, as we have already
stated that his fame rests chiefly on his superior knowledge of anatomy
and physiology.   He was, as might be expected, a favourer of the hu-
moral pathology (Marx, p. 43) ; he is accused by Galen of neglecting
to inquire into the causes why, in some cases of paralysis, sensation only
is injured, in others motion only, and in others, again, both sensation and
motion, though he was aware of the fact (Marx, pp. 44, 57) ; he appears
to have given great attention to the pulse, of which he made several subtle
and minute divisions, though he has not the honour of being the first

* It would seem, from his quoting Soranus through the medium of the Latin transla-
tion of Oribasius (p. 35) that Dietz's Greek edition of the complete work had never fallen
in the way of Professor Marx, which we regret the more, as he would have been able to
have added from it some interesting notices of the opinions of Herophilus on different
subjects connected with midwifery. See pp. 69, 99, 100, 123, 210, 211, &c.

† *De Arte Obstetr.* c. 22, p. 69.   ‡ *Histor. Animal.* lib. vii. c. 8, § 6.

§ This opinion seems to have prevailed almost universally among the ancients (See
Rufus Ephes. *De Appellat. Part. Corp. Hum.* p. 45 ; Galen, *De Usu Part.* lib. xv. c. 5.
tom. iv. p. 231 ; Theophilus, *De Corp. Hum. Fabr.* lib. v. c. 19, § 4), and evidently arose
from the dissection of animals, many of which have two umbilical veins. See Haller,
Physiol. lib. xxix. sect. 3. § 18, tom. viii. p. 220.

|| Τὸ χορίον, under which name both the *placenta* and the *chorion* were formerly com-
prehended.   See Casper Hofmann's *Comment. in Galen.* "*De Usu Part.*" § 1068 ;
Haller, *Physiol.* lib. xxix. sect. 3. § 5, 21. tom. viii. pp. 187, 226.

¶ Ἡρόφιλος δὲ τὰς φλέβας μὲν εἰς τὴν κοίλην φλέβα, ἀρτηρίας δὲ εἰς τὴν τραχεῖαν
ἀρτηρίαν, τὴν παρατείνουσαν τοῖς σπονδύλοις· πρὸ δὲ τῆς εἰς αὐτὴν ἐμφύσεως παρὰ
τὴν κύστιν αὐτὰς πλαγιοφορεῖσθαι παρ' ἑκατέρας πλευράς.

** Αἱ δὲ δύο [φλέβες] πρὸς τὴν ἀορτὴν, ᾗ σχίζεται καὶ γίγνεται ἡ ἀορτὴ δύο ἐκ
μιᾶς. *Hist. Animal.* lib. vii. c. 8, § 6.

person who discovered its value as a symptom of disease. (Marx, p. 46, &c.)
Perhaps the weakest point in Herophilus was his pharmaceutical practice,
as he seems to have been one of the earliest physicians who administered
large doses of hellebore, and other drastic purgatives,* and who (on the
principle that compound diseases require compound medicines,) began that
strange system of heterogeneous mixtures, some of which have only lately
been expelled from our own pharmacopœia, and which still keep their
place on the continent.† The principal part of Dr. Marx's account of the
surgical practice of Herophilus consists of rather a long fragment on the
mode of reducing a luxation of the femur, taken from the work *De Causis*
(Marx, pp. 58, 59), which, however, (if what we have said above be cor-
rect,) was written by Hegetor, and not by Herophilus.   It is curious to
find him stating that round ulcers are more difficult to heal than others
(Marx, p. 59); an opinion which, like many similar modern discoveries,
seems to have been neglected and forgotten for centuries, to be again
brought to light in our own days.   With respect to his practice in ob-
stetric medicine, we learn incidentally that in certain cases he considered
the sacrifice of the fœtus allowable (Marx, p. 60).   This is brought
against him as a charge by Tertullian, and certainly (from what we know
of the lax opinions of the ancients on this point),‡ we must confess that
the instrument he describes may very likely have been much abused; we
know also that the question cannot be even yet considered as unanimously
settled; but still we cannot but think that Herophilus was clearly right
in theory, however much his example may formerly have been followed
wantonly and unnecessarily, and that, when argued on religious and
moral grounds, this question becomes one of the simplest and plainest in
the code of medical ethics.§

Such is the imperfect abstract which we have been able to make of the
life and opinions of this celebrated man, which is derived, be it remem-
bered, not from the perusal of one or more of his own complete works,
but from extracts and allusions found in other authors, which we may

* See Isensee, *Gesch. der Med.* p. 91.

† In the London Pharmacopœia both the celebrated *Mithridatium* and the *Theriaca
Andromachi* were retained, certainly as late as the year 1771, and the edition of 1788 is
the earliest in which we have noticed their omission.   In the last edition of the Paris
Pharmacopœia (4to, 1837,) the *Theriaca* still appears in full glory.

‡ Thus, though in the Hippocratic "Oath" it is declared to be unlawful to produce
abortion, in another part of the Hippocratic Collection (*De Nat. Pueri*, tom. i. p. 385,)
we meet with the details of a case in which this was done, related without the smallest
appearance of compunction: an inconsistency, by the way, which those commentators
who suppose the two works to be written by the same person have been much puzzled to
reconcile or account for.   See Joannes Alexandr. in Dietz's *Scholia in Hippocr. et Gal.*
tom. ii. p. 216.

§ Professor Marx supposes (pp. 7, 60,) that it was Herophilus who instructed Agnodice
in midwifery, and that therefore, in Hyginus (*Fab.* 274, p. 201), instead of "*Hierophilo
cuidam*" we must read "*Herophilo* cuidam."   The conjecture is certainly very tempting,
and has occurred to so many of his biographers. that we are almost afraid to start any
objections; but still we would venture to suggest,—1. Whether the whole story (if it is
to be believed at all on the authority merely of Hyginus,) does not seem to belong to the
sixth or fifth century before Christ, rather than to the fourth or third?   2. Whether the
emendation is not *so very* easy and obvious, that (according to a well-known law in
criticism) the more difficult reading ("*Hierophilo*,") is on that very account the more
likely to be the true one?   3. Whether it is known that Herophilus was ever at Athens,
or Agnodice at Alexandria?   4. Whether it is likely that Hyginus would call so univer-
sally famous a physician as Herophilus, simply "*one* Herophilus" (Herophilus *quidam*)?

fairly presume to be in some cases given imperfectly, in others, perhaps, to
have been mistaken or even misrepresented ; and if we do not think him
quite so near to perfection as Professor Marx does, p. 60, (since we all know
that biographers often entertain an amiable prejudice in favour of their
hero,) still we are fully inclined to admit that he will always rank among
those few whose names are preserved from oblivion, not by the mere ac-
cident of their writings having escaped destruction, but on account of
their successful endeavours to promote the advancement of science, and
to add something to the amount of human knowledge, by finding a few
shells and pebbles on the shore of the Ocean of Truth.

With respect to the diligence and ability with which the work is exe-
cuted, we have already expressed our opinion ; and though in some points
we have differed from the author, and have explained our reasons for
doing so, yet Dr. Marx (who is himself a reviewer,) will easily conceive
that we should not have taken the trouble to do this in the case of a work
of which we did not think highly.*   In conclusion, we would venture to
suggest to Dr. Marx himself the execution of another work which he has ex-
pressed a wish (p. 16,) to see undertaken by some one fitted for the task,
a work of similar plan with the present, to which it would form the most
suitable companion ; we mean an account of the life, writings, and opi-
nions of that remarkable man, the contemporary of Herophilus at the
court of Ptolemy, with whose name his own is still commonly connected,
his equal in reputation during life, and his rival in posthumous renown—
ERASISTRATUS.

ART. IX.

A Practical Treatise on the Diseases of the Scalp.   By JOHN
E. ERICHSEN, Member of the Royal College of Surgeons, London.—
London, 1842.   8vo, pp. 192.

AT first sight it may appear strange that the knowledge of cutaneous
diseases (which from their situation come so immediately under the eye,)
has not kept pace with that of other and apparently much more obscure
disorders ; and that the information possessed by the great mass of prac-
titioners respecting them, should be more slender and superficial than
upon almost any other class of diseases ; and we may perhaps be excused
for noticing some of the circumstances which appear to have contributed
to this lack of knowledge.

The great number of these diseases would not be an obstacle to our
knowledge of them, if their characters were constant, and their appearance
in the different stages always similar ; this, however, is far from being
the case; many cutaneous diseases at the time when they come under the
notice of the practitioner being much altered in appearance, partly from
neglect on the patient's side, partly from the chronic nature of many of
these affections, and often from the abuse of a variety of local applica-
tions.   Many of the diseases of the skin, too, are not of that importance
to induce the patient to seek admission into hospitals.   The same facili-

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* We are sorry to be obliged to add, that the printer has not done justice to the work,
as, for so small a book, there are certainly an unusual number of typographical errors,
and some of considerable importance.

ties are not afforded for the study of cutaneous diseases in this as in other countries.   We possess no public institution at all approaching the hospital of St. Louis, for the reception and treatment of these affections, where the various forms of the same disease, whether arising from difference in situation or other cause are grouped together, and can be exhibited to pupils.   The confusion created by the difference in nomenclature and classification adopted by writers in this country and on the continent, (the same diseases in different stages being sometimes described as dissimilar affections, and the same terms employed in quite a different sense,) has also operated in retarding the knowledge of these diseases. But, there is another and perhaps a more powerful cause still to be noticed.   Many of these cutaneous affections being the ordinary attendants upon poverty and want of cleanliness, are necessarily in a great measure confined to the lower classes of society : hence there is not the same encouragement to their study, which that of many more fashionable diseases presents ; and the practitioner who devotes himself to their investigation and acquires character in their treatment, will seldom arrive at fortune, though he may at fame ; their study has consequently never been very popular, and but few men of talent (comparatively speaking,) have devoted themselves to this branch of pathology.   This perhaps applies more particularly to the cutaneous affections of the scalp than of the body generally ; for though these diseases are not confined to the lower orders, they are much more frequent among them than the upper classes ; and if they do occur among the latter, instead of being confided to the regular practitioner, they are usually handed over to some old woman, or equally ignorant quack.   We trust, however, the day is not distant when a change will take place in this respect, when the ignorance of the true nature and consequently of the proper scientific treatment of these diseases will be no longer general ; and we believe the treatise of Mr. Erichsen is materially calculated to bring about such a result.

Chap. I is devoted to an outline of the classification adopted, and to the causes, prognosis, diagnosis, and treatment generally of scalp diseases. After some preliminary observations upon the neglect of their study, and upon the confusion which has resulted from grouping together under the terms *porrigo*, and *tinea capitis*, diseases differing totally from one another, Mr. Erichsen arranges the cutaneous diseases which ordinarily affect the scalp in four classes, viz., Vesicular, Pustular, Tubercular, and Scaly. The vesicular diseases belong to the genera *eczema* and *herpes ;* the pustular to the genus *impetigo ;* the tubercular to *favus*, and the scaly to the genus *pityriasis.*

Eczema.   The varieties of eczema are among the most common cutaneous affections of the scalp.   With the exception of impetigo, says Mr. Erichsen, there is no disease which affects the scalp more frequently, and Mr. Phillips, in his lectures in the present volume of the Medical Gazette, observes that a very large proportion of the examples of scalp disease which come under his observation at the St. Marlylebone infirmary, are cases of this affection.

Willan and Bateman make three divisions of eczema, viz., E. solare, E. impetigenodes, and E. rubrum.   Mr. Erichsen follows the more scientific arrangement of Biett and Rayer in dividing the disease into acute and chronic eczema.

Acute Eczema is more frequently seen upon other parts of the body than on the scalp, as the organs of generation, groin, axilla, ears, back of the neck. A remarkable variety of this affection arising from the irritation of mercury is familiar to surgeons. Acute eczema of the ears is thus described by Mr. Erichsen :

" The ears become exceedingly red, tense, hot, and shining ; a number of small vesicles then appear, which contain a clear serum, of a reddish or yellowish colour ; when these give way, the fluid which is effused forms thin scales, or scabs, which are cracked in all directions. The pinna attains a very large size, becoming hypertrophied and often fissured ; sometimes indeed the swelling takes place to such an extent as to block up the meatus auditorius externus, giving rise to temporary deafness." (p. 42.)

The chronic forms of eczema of the scalp come more frequently under the eye of the practitioner than the acute ; and while little difficulty is experienced in the diagnosis of the latter, the former may be very readily confounded with several other cutaneous affections of this part.

Mr. Erichsen makes three divisions of chronic eczema of the scalp ; " 1st, simple chronic eczema, which may be either moist or dry; 2d, eczema furfuracea, corresponding to the porrigo furfurosa of Willan, tinea furfuracea of others, and the achor lactuminosus of Alibert ; 3d, eczema amiantacea, the teigne amiantacée or porrigo asbestina of Alibert, who was the first to describe it."

Simple chronic eczema is either moist or dry, and these two varieties frequently pass into one another, the moist becoming dry as the disease tends to get well. In the moist variety " the hair looks as if it had been soaked in a thin solution of gum-arabic, being matted together in locks, which have a dirty yellowish-gray moist appearance, and between and under which the inflamed scalp may be seen to be perforated by a number of minute openings, which pour forth the discharge ; as it lessens in quantity soft yellowish-gray scabs form, which gradually lose their moist appearance. A smell resembling that of the fumes of acetic acid is often evolved from it." The dry variety is characterized by scales or scabs of a yellowish-white or yellowish-green colour, usually lamellated, a line or two in thickness, separated from one another by cracks or fissures, at the bottom of which the inflamed scalp is seen covered by a mealy powder, the detritus of the scabs.

These two varieties of eczema often pass insensibly into one another ; both are common in infants at the breast, and during the second dentition : and children with light hair, fair complexion, and scrofulous constitution, according to our author and Rayer, appear to be more frequently the subject of it, than those of an opposite complexion ; though Mr. Phillips says he finds it to be very common also in children of a dark complexion ; simple chronic eczema of the scalp is much more frequent among the lower than the upper classes ; it often spreads over a large portion of the scalp, and extends to the forehead, face, ears, or back of neck ; it does not appear to be a contagious disease ; its duration varies according to the treatment pursued, if judicious from three to six weeks ; if the disease is neglected it may persist for many months ; in our experience it is always more tedious in the adult than in the infant. The older writers imagined that the eruption of eczema in children teething, protected them in some measure from attacks of convulsions or diarrhœa.

Diagnosis. The only cutaneous affection of the scalp with which this form of eczema is very liable to be confounded is impetigo eczematosa.

" In the later stages of the disease the scabs of eczema will be observed to be of a lighter colour, being yellowish-white or yellowish-gray, and more lamellated than those of impetigo, which are thicker, of an irregular shape, and of a yellowish-brown colour, presenting somewhat of a varnished or glazed appearance, and having a tendency to agglomerate in masses, whilst those of eczema appear rather to be spread out in layers, and are more friable and opaque." (p. 52.)

Treatment. The treatment of acute eczema of the scalp is simple and usually sufficiently obvious ; that of chronic eczema on the contrary is frequently tedious. The hair should be cut close, shaving it is not necessary ; poultices and fomentations are only employed by Mr. E. in the first instance to detach the scabs, afterwards he recommends (in the dry chronic form) lotions containing either the pure alkalies or their carbonates and sulphurets, in the proportion of one to three drachms to the pint of water. In the moist form ointments containing nitrate of silver, iodide of sulphur, bichloride, nitrate, or ammoniochloride of mercury, or sulphate of zinc are often necessary ; the ointment should be applied at night and washed off in the morning with any of the lotions before mentioned. We are surprised not to find any mention made of creosote, as a local application in the several forms of chronic eczema of the scalp ; we have often derived much benefit from this substance, both in the form of lotion and ointment ; nothing relieves the pruritus more effectually or more quickly than it. The oil-skin cap, in these cases, we entirely agree with the author in disapproving of ; a clean linen cap is decidedly preferable. The constitutional treatment must vary according to several circumstances ; we believe, however, that in the majority of cases it is at least of equal importance with the local.

We must pass over the author's observations upon eczema furfuracea, and E. amiantacea. In concluding a short account of the treatment of those two forms of the disease he justly observes, that " they will be found under any mode of treatment to be exceedingly rebellious and difficult of cure, frequently persisting for a great length of time under most judiciously directed means ; and appearing at length to cease spontaneously, rather than to yield to art."

The only other vesicular diseases which occur upon the scalp, are herpes circinnatus and H. zoster, the latter very rarely. The former is sometimes termed vesicular ring-worm ; both these affections, however, are uncommon upon the scalp, and both are described with sufficient accuracy in most systematic treatises upon cutaneous diseases.

IMPETIGO. The only pustular disease which (according to Mr. Erichsen) commonly affects the scalp is impetigo ; and two distinct forms of pustule are met with in this affection, viz., *psydracia* and *achores.*

" The psydracium is a pustule that is usually small and irregularly circumscribed, without much inflammation about the base, terminating in scabs which vary considerably in size and figure. It characterizes impetigo sparsa. The achores are larger, more superficial and confluent, with a more extensive inflammation about the base ; when they give way, yellow or brown-coloured scabs result, which however are not so thick or so dark as those that characterize the psydracia. This form of pustule occurs in impetigo eczematosa and impetigo granulata." (p. 78.)

Impetigo of the scalp, in our author's arrangement, comprises three species, viz., impetigo sparsa (porrigo favosa, Willan), impetigo granulata (tinea, or porrigo granulata), and impetigo eczematosa (porrigo, or impetigo larvalis).

Impetigo sparsa. We cannot help remarking that the name which Mr. Erichsen has chosen for this affection of the scalp appears to be rather an unfortunate one. The term impetigo sparsa had been already applied by Bateman, Biett, and others, to a pustular disease which particularly affects the lower extremities, and is but rarely seen upon the scalp. The porrigo favosa of Cazenave and Schedel is the porrigo lupinosa of Willan, and the favus dispersus of our author, a contagious disease. Mr. Phillips (Lectures, Medical Gazette, 1842,) considers the porrigo granulata of Willan as identical with the impetigo sparsa of other parts; and Burns looks upon the porrigo favosa and porrigo larvalis as being identical. "The small pustules of porrigo favosa (observes Rayer, Treatise on the Diseases of the Skin, translated by Dickinson, p. 147,) are never humid like those of impetigo, they are covered by a yellow dry crust of a cup shape. It is more difficult (he adds) to establish a clear line of demarcation between the pustules of porrigo larvalis and those of impetigo sparsa; some pathologists maintain that these are two distinct diseases, and others suppose that the difference between them results from the different texture of the skin of the regions on which they are developed, and the not less remarkable difference in the ages of the subjects of attack." Hence we fear that the author's application of this term will, in the present instance, tend rather to increase than to do away with the confusion which already exists in the nomenclature of these diseases.

Mr. Erichsen's description of impetigo granulata and impetigo eczematosa appears to be very accurate and complete; but as these diseases, under the names porrigo granulata and porrigo larvalis, are noticed at considerable length in works already in the hands of the profession, we shall not expatiate here upon their characters; merely observing that Bateman had already suggested the name impetigo larvalis, for the disease which Willan named porrigo larvalis; and although impetigo eczematosa is perhaps a better name, less confusion would probably have resulted from adopting his suggestion.

Causes of impetigo of the scalp. Age appears to have some influence upon the form which the disease assumes, impetigo eczematosa being most common about the period of the first dentition, and I. sparsa and I. granulata about the second dentition. I. eczematosa and I. sparsa are most frequently seen in children with fair skin, light ruddy complexion, and "who are frequently remarkable for their beauty." I. granulata, on the other hand, occurs in children with dark complexion, hair, and eyes, and a spare conformation. The varieties of this disease occur both in weakly children, who are badly fed and clothed, and in healthy children, who are over-fed. In many cases the affection cannot be referred to any cause. None of the species, according to Mr. E., are contagious; Alibert, however, notices the case of an infant who was inoculated with the impetigo eczematosa (porrigo larvalis), and took it.

Prognosis. "Impetigo of the scalp," Mr. Erichsen observes, "can scarcely ever be said to be a dangerous disease." Dr. Dewes, however

(in his Treatise on the Diseases of Children), states that he has seen two instances of death from porrigo larvalis (impetigo eczematosa). In these cases the itching was incessant, the disease continued many months, and the children were carried off by profuse diarrhœa. Mr. Plumbe (in his Practical Treatise on the Diseases of the Scalp) also notices the fact of this disease sometimes ending in marasmus, diarrhœa, and fatal hectic. On the other hand, Underwood (in his Treatise on the Diseases of Children,) says, he " never saw an infant much loaded with the porrigo larvalis (impetigo eczematosa) but it has always been healthy, and cut its teeth remarkably well; in general, however, although it appears in the most healthy children, yet it is the consequence of repletion, and the ir-ritation of undigested food upon highly excitable systems; and in these it probably prevents the attacks of more formidable diseases." The du-ration of impetigo of the scalp is from a few weeks to several months, or even longer; I. granulata is the most tedious; it is, however, the least common species; the disease is liable to recur a second or third time, after its apparent cure in the first instance; it does not destroy the bulbs of the hair, and leaves neither baldness nor cicatrices behind. It is not limited to the scalp. I. eczematosa often affects simultaneously the face, and scalp, and may spread to the neck, ears, and shoulders; it is some-times complicated with inflammation of the conjunctiva, and mucous membrane of the meatus auditorius externus; indeed Mr. Christian, of the Liverpool Ophthalmic Infirmary, has described an inflammation of the eye, so common an attendant upon this affection, that he named it por-riginous ophthalmia.

Treatment. When impetigo occurs in infants during the first dentition, and in a mild form, Mr. E. says, " it becomes a question whether we should not rather leave it to nature, attending merely to cleanliness, and making use of such simple palliatives as may be necessary to lessen irri-tation, than employ any very active means for its cure." This more par-ticularly applies to impetigo eczematosa. Plenck considered it dangerous to check suddenly the eruption, by external applications, imagining that it was likely to produce ophthalmia, cough, anasarca, hydrocephalus, &c. Dr. Granville thinks he has also observed this to be the case; and Billard (as quoted by Mr. E.) says he has always found that those children who were allowed to get well of this affection slowly and naturally, had a fine clear complexion, and were remarkable for their healthy appearance; and that, on the contrary, the sudden cure of it was very frequently at-tended by evident derangement of the health of the child.   " In some rare cases (observe Cazenave and Schedel, p. 220,) the appearance of porrigo larvalis (impetigo eczematosa) has seemed to have acted bene-ficially, and to have tended to the cure of more dangerous diseases." " In the generality of cases (according to Biett, American edit. p. 219), lotions of tepid water, milk, or decoction of mallows, which unite the double advantage of preventing the scabs from accumulating, and of calming the violence of the inflammation, should constitute the whole treatment; and, in children at the breast, the best remedy is to direct the nurse to wash the diseased parts with her milk."

When, however, the disease occurs in older children, and is attended by greater constitutional disturbance, more active measures must be re-sorted to. It is seldom necessary to shave the head, clipping the hair

close over and around the diseased parts will generally be sufficient; and the parts should be afterwards covered with an emollient cataplasm of linseed meal, or bread and milk ; if the irritation is so great as to deprive the child of sleep, a few leeches behind the ears, or below the angles of the jaws, will, as recommended by Rayer and our author, be of service ; general bloodletting is never necessary, and all stimulating applications to the head are injurious. The general treatment of this stage consists in keeping the bowels open by mild laxatives, such as '' sulphate of magnesia, tartrate of potash, sulphate of soda, with a few grains of the hydrarg. cum creta, or calomel." We entirely agree with Mr. E. in the following remarks :

" In the acute stage of impetigo of the scalp all specific remedies are perfectly useless, and indeed are positively injurious ; and it cannot be impressed too strongly that the only mode of treatment, whether topical or general, that is likely to benefit the patient, is one conducted upon mild, antiphlogistic principles." (p. 100.)

When the disease has lasted for a considerable time, and the inflammatory symptoms have been perfectly subdued, we may then, after the removal of the scabs, have recourse to stimulating topical applications, and Mr. E. finds none so useful as a lotion composed of sulphuret of potassium (potash ?) in the proportion of one to three drachms to the pint of water, and applied several times a day ; at the same time, the Harrowgate waters, or other sulphureous waters, natural or artificial, may be administered internally. Cazenave and Schedel prefer a lotion composed of one drachm of sulphuret of potash, and two drachms of subcarbonate of potash or soda, to the pint of water. Mr. Phillips recommends, after the application of the lotion, the parts to be covered with the common sulphur ointment, which is to be well washed off with soft or yellow soap, morning and evening, before the lotion is reapplied ; in some instances Mr. E. employs either an ointment of the nitrate of mercury, or of the peroxide of the metal ; but, in general, he considers that every useful purpose will be answered by lotions. Dr. A. T. Thomson, in his notes to Bateman's work, says he has seen no ointment so generally beneficial in porrigo larvalis (I. eczematosa), as the ung. hyd. nit. diluted with seven parts of spermaceti ointment. Rayer approves of sulphureous lotions, or ointments of the nitrate of mercury. Lotions composed of bichloride of mercury, alum, sulphate of copper, nitrate of silver, &c., have also been recommended, but Mr. E. considers them all inferior to the sulphuret. When the itching is very troublesome, he employs a lotion composed of oxide of zinc, suspended in rose-water, with the addition of a few drops of hydrocyanic acid.

While these local measures are being employed, the general health must be attended to ; indeed Dr. Crampton (in vol. iv. of the Transactions of the Association of the King and Queen's College of Physicians,) has given a series of cases of this and other forms of scalp affections, treated almost altogether by constitutional remedies, of which the chief were purgatives and the warm bath. Among constitutional remedies, the diluted mineral acids have been, in our hands, more efficacious than any other medicines. Mr. E. prefers the nitric or the nitro-muriatic ; we generally employ the dilute sulphuric of the Pharmacopœia. Mr. E. says he has never met with any cases of impetigo of the scalp that did not

yield to the judicious employment of the above plan of treatment, or that necessitated the use of arsenical preparations, or of the remedies that are usually looked upon as specifics in diseases of the skin.   No doubt, in the great majority of cases, the foregoing remedies are perfectly adequate to the cure of each and every form of impetigo of the scalp, but cases occasionally occur where they fail, and more energetic measures are required.   In such, the bichloride of mercury, in the dose of one sixteenth of a grain, or Fowler's solution of arsenic, in minute doses, will be generally productive of benefit. In vol. viii. of the Philadelphia Journal of the Medical Sciences, Dr. Hendrie has given some cases of impetigo which proved very obstinate, and were cured by the expressed juice of the sanguinaria canadensis.

FAVUS.   Under the genuine name favus, which corresponds to the porrigo of Willan, Bateman, and others; to the teigne of Alibert and Mahon, and to the tinea of other writers, Mr. Erichsen includes only two species, viz., *favus dispersus* (porrigo lupinosa, Willan,) and *favus confertus* (porrigo scutulata of others).   Hitherto the greatest confusion has prevailed in this division of the subject.   Thus Willan and Bateman make six species of porrigo, viz., P. larvalis, P. furfurans, P. lupinosa, P. scutulata, P. favosa, and P. decalvans.   Mr. E., however, has shown that porrigo larvalis and P. favosa are species of impetigo, P. furfurans a species of eczema; and that the partial baldness described by Willan under the name P. decalvans, is merely the result of the destruction of the hair from a previous attack of favus dispersus, or confertus.   Alibert has described five varieties, under the genuine name tinea, viz., teigne faveuse, T. granulée, T. furfuracée, T. muqueuse, and T. amiantacée. The teigne faveuse of Alibert is very distinct from the porrigo favosa of Willan, and the T. furfuracée and T. amiantacée are varieties of chronic eczema.   Cazenave and Schedel make four species of porrigo; viz., P. favosa, P. scutulata, P. granulata, and P. larvalis; the P. granulata and P. larvalis they consider to be more closely allied to impetigo than to porrigo; and their P. favosa is identical with the P. lupinosa of Willan. Rayer admits four species of tinea (which term he employs only because it has been long in use), viz., T. favosa, T. annulare, T. granulata, and T. mucosa.   He, however, regards each as perfectly distinct, and not as species or varieties of the same disease.   M. Mahon, in his work on the subject, makes eight species of tinea, or teigne, but, under this general term, he has grouped together vesicular, pustular, tubercular, and scaly diseases.   In confining the genus *favus* to two well-marked species, Mr. E. but follows out an idea long since suggested by Biett, in his lectures.   " If species must be made (MM. Cazenave and Schedel observe, p. 233, ed. 1828), M. Biett is of opinion that they must be reduced to two, P. favosa and P. scutulata (favus dispersus and F. confertus of Mr. E.); in fact these two species alone present characters which are not to be found in other orders."

Seat of favus.   Respecting the seat of favus much contrariety of opinion has existed ; our author coincides with Rayer in considering favous matter to be originally deposited in the dilated cavities of the cuticular conduits of the hair; in other words, within the hair follicles, but upon the surface of the prolongation of the cuticle which lines them.

Nature of favus.   The majority of writers consider favus to be a pus-

tular disease ; Mahon regards it as a morbid secretion of the sebaceous follicles (in which he places its seat), and recently it has been supposed to be a parasitical growth, analogous to fungi, or to those vegetable productions which form in some fermented liquors. Mr. E. considers favous matter to be a modification of *tubercle.*   By the term tubercular he does not mean " a disease like lupus, characterized by small, firm tumours, but one the essential nature of which consists in the deposition of that heterologous formation called tubercle." Into the arguments brought forward by our author in proof of his position, want of space forbids us to enter ; the following summary contains the substance of them.

" Favus, in its elementary form, differs from pustule,—1st, in the favous matter being poured out upon a free surface, and not upon or within the cutis, and under the cuticle :—2d, the favous tubercle is frequently chronic, existing in an imperfectly developed state for a length of time, which is never the case with pustule.   Favous matter differs from pus,—1st, in concreting very quickly after it is poured out, even before exposure to the air :—2d, in its chemical composition ; favous matter containing much more earthy salts, and coagulated albumen, than pus. Favus and tubercle agree in their seat [the lining membrane of the hair-follicles appearing to Mr. E. to partake, in a great measure, of the characters of mucous tissue], in the manner of their formation (both being eliminated in a fluid state, but solidifying very quickly,) in their mode of growth (by eccentric deposition, and not by any increase from within,) in form, colour, and chemical composition ; in most of the causes that predipose to, or excite them ; in the age at which they most frequently occur ; and in the colour of the cicatrices which are left." (p. 117.)

Diagnosis. Favus being the only really contagious disease of the scalp, its diagnosis is of the utmost importance, and, in the majority of cases, this presents little difficulty.   " It is distinguished from all other cutaneous affections of the scalp, by its small, yellow tubercles ; by its circular, dry, cup-shaped crusts ; by the baldness that it occasions ; and by its contagious nature."

Treatment.   There are probably few diseases (as Mr. E. remarks) for the cure of which so many different modes of treatment have been employed, and such a variety of specific remedies vaunted as for favus; and this (he adds) can be readily accounted for, when we reflect upon the obscurity which has hung over its diagnosis, and on the extreme obstinacy with which (when fully established) it resists almost every plan of treatment.

In the local treatment there are three indications to be fulfilled, in which almost all writers on the disease are agreed,—viz., to detach the scabs, to remove the hair from the diseased follicles, and to set up a new action in the affected part.

In order to detach the crusts and scabs, the hair must be cut short ; and poultices either of bread and milk, linseed, or oatmeal applied ; in very obstinate cases we may have recourse to brown soft soap, reduced to a stiff jelly, or soap and oatmeal half boiled, and mixed as recommended by Dr. Crampton.   At the same time a lotion composed of an ounce of diluted hydrochloric acid to the pint of water may be employed; and the head must be regularly washed with soap and water.

The second indication consists in the removal of the hair from the diseased follicles, which, according to Rayer, is as essential in the treatment of favus as is the removal of the nail in some forms of onychia. Biett, however, questions this assertion.   " Is the presence of the hair

(he asks) as prejudicial as some authors insist ? and when it falls off from
the effects of the disease does the latter disappear ? On the contrary the
scabs often remain for years on places where there is no hair." To effect
the removal of the hair an adhesive plaster, (called the pitchcap,) com-
posed of black pitch, resin, and Burgundy pitch was formerly applied
tightly to the head after the scabs had been removed by poultices and
the hair had been shaved ; at the end of some days it was suddenly
raised in a contrary direction to that in which the hair grows ; and a se-
cond was applied ; the process was repeated every third or fourth day for
months. The cap has now been abandoned many years by regular prac-
titioners, " and we can scarcely credit (as Biett observes,) how ignorance
could dare to make use of so cruel a method." Mr. Plumbe employed a
forceps for extracting the hairs, and this plan, though very tedious, had the
advantage over the ' pitch-cap,' of being much less painful, and of only
removing the hairs from the diseased parts ; it is however seldom or never
employed at the present day. The hair may be readily detached by mild
depilatories with certainty and without pain ; for this purpose Biett em-
ployed an ointment, composed of sub-carbonate of potash or soda and
lard, in the proportion of one or two drachms to the ounce, and rubbed
on the diseased parts for five or ten minutes each day ; mild alkaline lo-
tions, composed of two drachms of those salts to a pint of water being
employed at the same time.

For the fulfilment of the third indication, that of setting up a new ac-
tion in the part, Mr. Erichsen gives the preference to the iodide of sul-
phur, sulphuret of potassium, (potash ?) and carbonate of potash. The
iodide of sulphur is employed in the form of ointment made with ten or
twenty grains to the ounce of lard. The carbonate of potash lotion has been
already mentioned ; and the sulphuret of potash lotion is used to remove
the scurfy condition of the scalp left after the separation of the scabs.

Mr. Erichsen's observations upon the constitutional treatment of favus
are few and unimportant ; he evidently has no confidence in it alone, but
trusts chiefly to local remedies. In concluding his account of favus he
makes the following remarks :

" It may be confidently stated, that by patience and perseverance in the em-
ployment of the means above indicated, and by scrupulous attention to clean-
liness there are few cases of favus that will not speedily be cured ; and that
this disease, instead of continuing as it ever has been an opprobrium to medical
men, can be as successfully treated, in the great majority of cases, as most
other cutaneous affections." (p. 160.)

Chapter V. of Mr. Erichsen's work is devoted to the scaly diseases
only one of which, pityriasis, ordinarily affects the scalp ; chapter
VI. to the diagnosis of the diseases of the scalp ; and chapter VII. to
the diseases of the hair. But as we have already exceeded the limits
assigned to this article we must conclude. We cannot do so, however,
without expressing our approbation of the beauty and fidelity of the
plates, which considerably enhance the value and utility of the work ; and
we have no hesitation in expressing our belief that the publication of
Mr. Erichsen's work will give an impulse to the study of the cutaneous
affections of the scalp, that was much wanting. We would earnestly re-
commend its perusal to all who desire to treat those diseases upon scien-
tific, rather than empirical principles.

Art. X.

1. *Fallacies of the Faculty ; with the Principles of the Chrono-thermal System. In a Series of Lectures.* By Samuel Dickson, m.d., late a Medical Officer on the Staff. Second Edition.—*London,* 1841. 8vo, pp. 328.
2. *Erreurs des Médecins, ou Systéme Chrono-thermal ; traduit de l'Anglais du Dr. Dickson.* Par Malvius, a.d.c.—*Paris,* 1842. 8vo, pp. 560.

The author of this publication insists that the medical profession, as a body, are " swindlers," and something worse ; that " the whole *régime* of medical teaching is a system of humbug, collusion, and tricks ;" and " that the notions which have hitherto guided physicians in their treatment of disease are a mere romance." He proposes to work a thorough revolution in medical science and morals ; and, while he exposes the fallacies and crimes of the faculty, humanely sets forth an absolutely novel, correct, and complete system of medicine of his own. He is evidently a person of infinite magnanimity. He feels convinced that he will be a martyr to his faith ; but, fearlessly classing himself with those persecuted lovers of truth, the Harveys, Newtons, Parès, Jenners, and Lady Mary Montagues, he awaits his fate with the heroism becoming his great mission. Being ourselves persecuted lovers of truth, we shall examine the new system of Dr. Dickson in a dispassionate spirit, and notice the other little points respecting medical ethics as we have space.

Our author (in the name of truth) appeals to " nature, eternal nature. By this," he remarks, " and this only, am I willing that the new fabric of medicine which I have presumed to erect upon the ruins and reveries of the past, should be tested and tried ;" pathetically adding " till the world shall detect one real, one indubitable fact militating against the views I am now about to develop, let not innovation be charged against me as a crime." This preliminary squeak for mercy comes in rather awkwardly, to say the least of it. The world will most likely look upon Dr. Dickson's innovation as a pleasantry ; and certainly, we shall seek for no militant facts, but simply confine ourselves to ascertaining whether the facts adduced in its support by Dr. Dickson himself are of the right sort and convincing. Dr. Dickson cannot desire us to do less.

This new system is termed *chrono-thermal*, because it refers to time and temperature. There can be no increase or diminution of temperature without motion, no motion without time ; motion consists in attraction and repulsion ; attraction and repulsion are peculiar to electric action ; *argal*, medicines must change the motions of the system, and must be electrical in their operation. But our author shall state his own views. Having laid down the phenomena of health, he observes :

" If we analyse these various phenomena, we shall find that they all consist in a series of alternate motions, motions for the fulfilment of which, various spaces of time are requisite ; some being diurnal, some recurring in a greater or less number of hours, while others exhibit a minutary or momentary succession. At morn, man rises to his labour ; at night he returns to the repose of sleep ; again he wakes and labours—again, at the appointed period, he ' steeps his senses in forgetfulness ' once more. His lungs now inspire air, now expel it—his hear successively contracts and dilates—his blood brightens

into crimson in the arterial circle of its vessels—again to darken and assume the hue of Modena. The female partner of his lot, she, who shares with him the succession of petty joys and sorrows, hopes and fears, which make up the day-dream of life, has yet another revolution, the *catamenial ;* and *parturition,* or the process by which she brings their mutual offspring into the world, is a series of pains and remissions." (p. 11.)

Every atom of the material body is constantly undergoing a revolution or alternation at regular periods. "It is everything by turns, and nothing long," remarks Dr. Dickson.

" Gentlemen, There can be no motion in matter *without change of temperature,* and no change of temperature *without motion in matter.* This is so indisputable an axiom in physics, that Bacon and others supposed motion and change of temperature to be one and the same.......If even in the middle of winter, you run for any length of time, you shall become heated and bloated ; and you again shrink in size when you stand still to cool yourselves. Those who ascribe the source of animal heat exclusively to the lungs, seem to have forgotten these facts : they have forgotten, that in the constant mutation of its atoms, every organ, nay every atom of that organ, being ever in motion, must equally contribute to this end ; for to this common law of ALL matter, every change in the body is subjected.* The powers by which the corporeal motions are influenced, are the same that influence the motions of every kind of matter, namely, the electric, mechanical, and chemical forces, and the force of gravitation. When rightly considered, the whole of these powers resolve themselves into ATTRACTION and REPULSION. It is by *attraction* that the fluid matter of the blood first assumes the solid consistence of an organ ; again to pass by *repulsion* into the fluidity of secretion." (p. 12.)

This is an exposition of the first principles and physiology of the *chrono-thermal* system. The pathology is thus expounded : " Whatever be the cause or causes of corporeal aberration, in obedience to the law of all matter, the first effect is a *change of temperature.* The patient accordingly has a feeling of heat or cold." But our author must state his own views :

" Gentlemen, We have already analysed the Life of Health. If, in the language of Shakspeare, it be indeed a '*fitful* fever,' what can the morbid modifications of that life be, but modifications of FITFUL or INTERMITTENT FEVER ? .... If we succeed in proving to you that asthma, epilepsy, toothach, gout, mania, and apoplexy come on in *fits ;* that all have febrile *chills* or *heats ;* that remissions or periods of immunity from suffering are common to each ; and that every one of them moreover *may* be cured by any one of the agents most generally successful in the treatment of INTERMITTENT FEVER, popularly termed AGUE ; to what other conclusion can we possibly come, but that this same AGUE is the type which pervades and the bond which associates together every one of these so-called different diseases ? But if in the course of these lectures we further prove that what are called ' inflammations' also come on in fits ; that they have equally their periods of immunity from pain, and yield with equal readiness to the same remedial means, who can be so unreasonable as to doubt or dispute that AGUE IS THE TYPE OF ALL DISEASE?" (p. 17.)

Aye, Who? But then there are those IFS ; and as a sceptical reader may exclaim, " in the language of Shakspeare,"

" Talk'st thou to me of *ifs?*"

Dr. Dickson furnishes proofs sufficient—in number, at least—for the

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* In this and all subsequent quotations we give the *capitals* and *italics* of the author just as we find them in the book.

most sceptical. This, the first lecture, closes with a promise to prove in the next that "asthma, epilepsy, palsy, curved spine, squint," &c. are merely so many developments occurring in its [an ague's] course; *analytically*, by rigidly scrutinising their symptoms; *synthetically*, by detailing cases of each cured on CHRONO-THERMAL principles. We shall note the cases and pass over the analytical argumentation. We would observe, however, that the author commences this latter by assuming that he has " proved, that healthy life is a FITFUL FEVER," on the authority of Doctor Shakspeare, we suppose, as there is no other proof of this great fact than what is contained in the passages placed before our readers. It is true that we have a passage in which the human system is compared to our globe; and its vital mutations, " such as tumours, abscesses, and eruptions," to the " new-formed mountain-masses, earthquakes, and volcanos" of our mother-earth. But to make this argument valid, it should have been proved that all the earth's changes are developments of an ague. This Dr. Dickson does not prove. His great authority, Dr. Shakspeare, appears, indeed, to hint that the earth is liable to attacks of intermittents, at least to the *chilly* or shaking stage. Glendower says:

> " At my birth,
> The frame and huge foundation of the earth
> *Shaked* like a coward."

According to the same writer the earth suffers from " windy colic" sometimes; which disease, chrono-thermally speaking, is an ague. The following are cases in " proof" of the *thermal* portion of Dr. Dickson's system :

" Sir R—— A——, while serving in Portugal, became the subject of severe ague, which resisted a host of remedies prescribed for him by numerous medical friends—bark among the number. One day when riding out he was seized with a paroxysm. The inmate of a little shop where he dismounted till the fit should be over, suggested to him to try the barber-surgeon of his neighbourhood. . . . . The ambidexter man of medicine came, ordered him a large plaster to his back, and the ague was forthwith cured! Gentlemen, to what but to the improvement of the *temperature* of the spine must we attribute the success of the plaster?" (p. 27.)

" I have said that ASTHMA is a remittent disease. In one case, that of a gentleman who had the disease every second night : after having nearly exhausted all my best resources, I succeeded in curing him by the application of a *warm* plaster along his spine. Here you again see, in the most direct manner, the advantage of attention to *temperature*. The spine in this case was always chilly, but became warm and comfortable under the use of the plaster." (p. 30.)

The great majority of urethral strictures yield readily to "*chrono-thermal*" treatment in Dr. Dickson's hands. Bougies, those cruel instruments, used by none but dishonest persons, may be almost dispensed with. Curved spine, which Stromeyer and a few other insignificant schoolmen, have attributed to paralysis of certain sets of muscles, is also in the opinion of Dr. Dickson a remittent affection ; proved as follows :

" In the commencement of most cases of this kind, the patient is taller one day than another, a proof of remission ; and I have never had such a patient who has not confessed to heats and chills. I will give you two cases in which these phenomena were observed :

" A young lady, aged sixteen, had a lateral curvature of the dorsal vertebræ, causing the inferior angle of the shoulder-blade to protrude. I prescribed for

her calomel and quinine, in small doses, and directed her to have her spine rubbed night and morning with soap liniment. In less than a month, the patient gained three inches in height, and in two months more she was erect." (p. 37.)

The other case was that of a lady, aged forty-five, who "stood upright" in three weeks. Squint and amaurosis are proved to be merely developments of remittent fever, and yield readily, of course, to chronothermal remedies, pregnancy being one of these. Deafness is in the same category, and so are bulimia, &c.

"If patients who are subject to DEAFNESS be asked whether they hear better upon some days than others, the great majority will reply in the affirmative. So that deafness also is a remittent disease. That it is moreover a feature or development of general constitutional disorder is equally certain, from the *chills* and *heats* to which the great body of patients affected with it, acknowledge they are subject." (p. 41.)

"A gentleman, who was fond of play, told me that when he lost much money he was always sure to become *ravenously hungry ;* but that when he won this did not happen. The *temperature* of his body must have been different at different times." (p. 42.)

If we were to go through the cases of hemorrhage, apoplexy, heart-diseases, gout, stone, consumption, &c. we should only multiply cases resembling the preceding. Dr. Dickson is satisfied no one ever explained the real nature of phthisis before himself. The relation of that disease to ague is clearly established by "*chills and heats,*" and the similarity of modes in which the two diseases may be cured. Dr. Dickson observes, "with quinine and other chrono-thermal medicines, I am satisfied I have cured or arrested at least 500 cases of consumption, many of them, too, in apparently advanced stages." Scrofulous joints are cured, we may say, "in a winking."

"Harriet Buckle, seven months old, had what is called a scrofulous elbow. The joint was much enlarged, red, painful, and pervious to the probe, with discharge. The patient was the subject of *diurnal fever.* . . . . A powder, containing calomel, quinine, and rhubarb, in minute doses, was directed to be taken every third hour. The case was completely cured in a fortnight without any external application." (p. 79.)

Another case is a girl, aged twelve, was cured in six weeks. All kinds of inflammations are proved in this manner to be agues, and readily curable by chrono-thermal medicine, whether the so-called inflammation be in the brain, or bowels, or lungs, or heart, &c. Bloodletting of every kind is not only denounced as unnecessary and cruel, but convincingly shown to be impious ; thus :

"Has not nature done everything to preserve to animals of every kind

'*The electric blood* with which their arteries run !'—Byron.

She has provided it with strong resilient vessels,—vessels which slip from the touch, and never permit their contents to escape, except where their coats have been injured by accident or disease. Misguided by theory, man, presumptuous man, has dared to divide what God, as a part of creation, united—to open what the Eternal, in the wisdom of his omniscience, made entire ! See ! what an *extreme* this is ! It is on the very face of it a most unnatural proceeding," &c. (p. 99.)

The profession ought to have a general fast, and all day long repeat the litany, as one method of escaping the vengeance due to their impious presumption in phlebotomising their patients. Abstinence is also noticed as a dangerous thing. "Beware of carrying this too far !" says

our author, " for abstinence engenders maladies : so Shakspeare said,
and so nature will tell you, in the teeth of all the doctors in Europe !"

Smallpox is one of the few diseases which our author does not perfectly
comprehend.   He queries whether vaccine lymph be, "as Linnæus
thought, of an animalculine character ? or is it at all analogous to the
influence produced by the magnet on iron ?"   Dr. Dickson has been in
the profession for seventeen years, and declares he never saw syphilis,
although eight of those years were spent in the army.   There is no such
thing ; the series of phenomena ignorantly termed syphilis, being simply
developments of ague, and curable by chrono-thermals, as iodine,
calomel, &c.

Mania only differs in degree from a violent fever.   Both have re-
missions, both are cured by the same remedy, namely, a ligature to a
limb. "Mania, epilepsy, asthma, cramp, AGUE, then," writes Dr. Dickson,
" completely establish their fraternal relationship by means of the liga-
ture."   Is not the relationship of ague (we would ask Dr. Dickson), rather
paternal or *maternal*, than fraternal ? or is it *conjugal ?*

Chlorosis, menstruation, and leucorrhœa are all modifications of inter-
mittent fever; and the diseases are to be cured by chrono-thermal remedies;
a *warm* plaster, for example, to the spine in leucorrhœa.   Cancer is
in the same category ; it is an ague.

" Analyse this disorder [cancer], and you will find it resolve itself into a
general intermittent febrile action of the whole body, varying in its shade with
every case.   Cancer, then, is a development of that fever.   Gentlemen, never
in my life did I meet with a cancer in any state or stage, the subject of which
did not acknowledge to chills and heats, or who did not admit errors of se-
cretion." (p. 214.)

All tumours are agues :

" In the course of my professional career, I have witnessed tumours of every
description, but I never met one that could not be traced to previous consti-
tutional disturbance. .... Chills, and heats have been confessed to by
almost every patient, and the great majority have remembered that in the earlier
stages, their tumour was *alternately* more or less voluminous." (p. 219.)

Pregnancy and parturition are agues :

"Pregnancy *is* a natural process ; but is it on that account the less surely a
febrile state ? Is it for that reason the less certainly an *intermittent* fever?"
(p. 223.)

Pregnancy will cure a squint; Dr. Dickson witnessed a splendid
" case;" and therefore this state harmonizes completely with the unity
which pervades disease generally.   Parturition, too, is a series of pains
and remissions :

" In spite of every assertion to the contrary, then, in spite of every declaration
on the part of medical or other persons, pregnancy and parturition *are* agues—
agues in every sense of the word ; for not only do their revolutions take place
in the same identical manner as ague, but like agues, they may be influenced by
medicines as well as by mental impressions." (p. 224.)

The passions are agues. Love is most certainly, because Hudibras
said it was an ague-fit reversed ; the hot stage coming first.   The earth
in a fright is in a fever, has a regular ague fit.   Medical practitioners
who go and see their patients with long lugubrious faces, do the trick on
set purpose.   They know well that fear is an ague-fit, and therefore re-

tards convalescence, much to their pecuniary benefit. " The mode of its action establishes beyond cavil," Dr. Dickson observes, " not only the unity of disease, but the unity of action, of remedy, and cause."   Baths and plasters are useful because they are *warm;* bandages because they alter the motions and temperatures of parts; ointments because they are but combinations of the agents with which we combat fever.

Hahnemann and homœopathy are unmercifully scouted by Dr. Dickson; a fact exhibiting a proof of the wisdom of Shakspeare, when he wrote

"Tut man! one fire puts out another's burning."

Ague and Hahnemann being here in opposition, and extinguishing each other.   Dr. Shakspeare, our author insists, discovered homœopathy, and not the impudent Hahnemann.

We have not room for the proofs Dr. Dickson adduces, that the action of *medicinal* agents is purely electrical; but they resemble all his other proofs.   The doctrine is extended to animal tissues.

" You may with the most perfect propriety ask, why the influence of opium on the brain should set one man to sleep and keep another from sleeping?.... .... The answer is simple, and affords a fresh illustration of the electrical doctrine.   The atoms of the specific portion of the brain of any two individuals thus oppositely influenced in either case, must be in *electrically opposite* conditions, *negative* in one, and *positive* in the other." (p. 284.)

Dr. Dickson adds, " the merit of this explanation I exclusively claim. —Yes! Gentlemen! I exclusively claim the ELECTRICAL DOCTRINE of medicinal agency as mine."

To us the electrical doctrine is stark staring nonsense; but this may be because we are schoolmen and, as far as our ability would permit, have studied electricity and organic chemistry.   This doctrine, however, explains the *modus operandi* of all medicinal agents.   For example:

"IODINE.   Gentlemen, like every other remedial agent it cuts two ways, anatomically *attracting* or lessening volume and secretion in one case, anatomically *repelling* or increasing both in another, according to the *electric* state of the body for which it may be prescribed." (p. 294.)

" ALUM.   The earth called alum is a favorite with the common people in the cure of ague.   What is its mode of action?   Its power of astringency or attraction simply—the same power by which it arrests the morbid increase of secretion, called leucorrhœa.   How does it do that?   By its attractive influence over the atoms of the spine, and the nerves proceeding from the spine.   Well, then, that is the way in which it cures ague." (p. 299.)

We can only exclaim, lost in admiration and wonder, " What it is to be a scholar!"

The lapses and backslidings to which professors of religion are subject are influenced by electricity, and are (" as one may say,") *agueish.* Shakspeare proves it.

" That excess of religious feeling, or *veneration* (as the phrenologists call it), does, however, depend upon the temperature or motive condition of some cerebral part, there cannot be a doubt; and that it takes place by fits or periods, Shakspeare well knew, for he makes one of Clarence's murderers say,—' I hope this holy humour of mine will change; it was wont to hold but *while* we could count twenty.'" (p. 312.)

So that Shakspeare not only anticipated Dr. Dickson in periodicity, but has given the measure of the periods; namely, " while one could

count twenty;"—a great deal more than our modest author has ven-
tured on.

Our readers will, by this time, have formed an opinion of Dr. Dickson's
publication. We have done justice to his doctrines, by giving them and
the proofs in his own language. The plain truth is, as every one must
see, the whole book is a farrago of nonsense ; a hash of a few old truths
and many fantastic speculations, made piquant by the most amusing self-
laudation on the part of its author, and the most extravagant abuse of
his professional brethren and imagined rivals. It is clear that Dr. Dickson
cannot have derived his knowledge of the foolish, murderous, and dis-
honest practices he attributes to ten or twelve thousand individuals, from
personal knowledge ; it can only have been obtained by his acquaintance
with a few,—and bad ones they have been. So intimate is his knowledge
of professional turpitude, that one cannot help thinking of the pithy adage,
" Set a thief to catch a thief,"—but, of course, not thinking of applying
it to him. Like " one of the wicked," as Falstaff says, who has become
honest and turned informer, Dr. Dickson declares he will make people's
ears tingle by his revelations, if provoked to desperate deeds. We hope
our professional brethren will endure the exposure with fortitude. M.
Malvius (who seems to have judged that the piquancy we have alluded
to would suit the French market) observes, that Dr. Dickson's "clientel"
is very numerous. We have made an approximative calculation on this
point, on the plan of the new numerical method. We have reduced the
various orientalisms in his publication, such as " many thousands,"
" hundreds," " a host," " dozens," &c., into plain numerals ; and we
estimate the total number of cases Dr. Dickson has treated at one
hundred thousand. There are, to be sure, discrepancies. Dr. Dickson
himself asserts, that, " out of upwards of TWELVE THOUSAND cases of
disease that have, within the last few years, been under my treat-
ment," *he has not been compelled to abstract blood* ONCE ; but Dr.
Fosbrooke, in a letter to Dr. Dickson, says, that in April, 1835, he
pricked up his ears at Dr. Dickson's " repeated asseverations that in a
practice embracing the treatment of *several thousands* of patients *per
annum*, he never employed a lancet or a leech." We do not feel sur-
prised that Dr. Dickson should state one year's practice only, as the
practice of " the last few years." He is a modest man ; and besides, it
was necessary to be careful, lest he should be identified with the other
" medical dissenters" who deal in thousands; as, for example, the authors
of such an announcement as the following :—" Extraordinary sale of
Parr's Life Pills ; ONE HUNDRED AND SEVENTY-FIVE THOUSAND in one
week !" To guard himself still more effectually against any imputation
of this kind, Dr. Dickson very pithily and justly remarks, " Impostors
never fail !" The diseases our author has really failed to cure or alle-
viate by bark, are only tetanus and hydrophobia. (p. 303.) Having failed
in those he is, of course, no " impostor."

We freely accord Dr. Dickson the triple crown in modern science, as
the greatest physician, philosopher, and poet of the age ;—the Homer,
Plato, and Hippocrates of modern times. Our tiara must, however, be
made of *foolscap*, being the material nearest at hand, and of which we
always make use when crowning great men like our author. Perhaps
Dr. Dickson, being a man of warm feelings, may think our strictures

severe, and, in the next edition of his book, may be inclined to be severe
upon us.   We crave his mercy, even for his own sake.   We would advise
Dr. Dickson to be mild, and eschew all symptoms indicative of a "fitful
fever," lest—to quote the words of a little *chanson* in our memory (*not*
one of Beranger's)—

> "Lest people should cry
> As he passes by,
> There goes *Ague-Dick* in a flutter!"

If that expressive sobriquet should attach to our author, he might aptly
exclaim, with *Ague*-cheek, in the "Twelfth Night,"—

> "'Slight, do you mean to make an ass o' me?"

Certainly not, we would answer. But has not Dr. Dickson made an ass
of himself?   Aye, there's the rub!—"in the language of Shakspeare."

Art. XI.

*Recherches sur les Abcès Multiples, et sur les Accidents qu'amene la
présence du Pus dans la Systême Vasculaire.*   Thèse par Felix
D'Arcet, m.d.—*Paris*, 1842.   4to, pp. 85.

*Researches on Multiple Abscesses, and on the Morbid Effects of the
presence of Pus in the Vascular System.*   By F. D'Arcet, m.d.—
Paris, 1842.

It is known to all engaged in the practice of surgery that purulent de-
posits in distant parts, sero-purulent effusions into the serous and
synovial cavities, and typhoid symptoms of the worst character are of
frequent occurrence after wounds and operations, and that the same
events not rarely supervene upon some local diseases not connected in
their origin with external injury.   This subject has appeared to the au-
thor of this thesis to admit of further elucidation by experiment; for,
however fully these effects have been described, however attentively the
circumstances under which they have taken place have been observed,
however fully the symptoms accompanying them have been noted, there is
as yet no agreement of opinion as to the mechanism of their production.

It seems to be allowed on all sides that the consequences in question
owe their origin to the presence of pus in the blood; but how the pus
gets or is produced there is variously accounted for.   It has been attri-
buted, 1st, to the absorption of pus from the wound by the capillaries and
veins open in it; 2d, to phlebitis; 3d, to metastasis; 4th, to the puru-
lent diathesis or pyœmia; 5th, to the evolution of preexisting tubercles.

M. d'Arcet, without discussing the merits of these different theories,
and without adopting any opinion as to the mode by which the pus is
mixed with the blood, assumes this ultimate result of all these views to
be established, and then proceeds to describe the consequences of various
experiments which he made upon animals by injections of this fluid in
different states into their veins.   Previous to doing so he remarks that
it has sometimes been asserted that multiplied abscesses, as he de-
signates them, or purulent deposits, as we usually call them, have this
peculiarity, that in the organ or part where they appear, none of the
other ordinary evidences of inflammation are present, but that the pus
seems as if deposited without any previous process of the kind.   This he

declares to be an error, for that he has always found a red spot of inflammation to precede their appearance, and when pus is actually present, coagulable lymph is deposited around it, which, becoming organized, assumes the appearance of a sort of cyst, having its internal surface as flocculent as that of the chorion itself.

If we take healthy pus, such as is the product of phlegmonous inflammation, and expose it to the action of oxygen gas, directly or through the intestines of a living animal, or a piece of gold-beater's leaf, it soon absorbs a volume and a half of the gas, producing only a fifth of carbonic acid. While this takes place the pus-globules run together and agglomerate, and form an amorphous layer or coat, which floats on the subjacent liquid. If exposure to the air or oxygen be continued, the whole becomes offensive and putrid, without, however, the layer above mentioned becoming redissolved; and if we separate it by means of the filter we obtain a yellowish-green fluid, blackening silver, and evidently containing sulphuretted compounds, upon which a portion, yet not all of the poisonous properties depend, seeing that these remain when the former have been removed by mixing litharge with the fluid.

Taking the *first product* of the spontaneous decomposition of pus, the amorphous, inert, and insoluble layer or substance, and having repeatedly washed it, M. d'Arcet injected it into the jugular veins of rabbits and dogs. Where the animals were not immediately killed by the injection, which frequently happened, sometimes they got up, after a few moments of syncope, remained for a longer or shorter time in a state of prostration and weakness, and then recovered, without any traces of the experiment being left; at other times the depression increased, the animal retired into a corner, the pulse got frequent and hard, the respiration hurried, and death ensued, never later than forty hours after the experiment—death taking place quietly, without diarrhœa, vomiting, &c. On examination there were found phlyctenæ of the lungs, subpleural ecchymoses, penetrating into the parenchyma, with a nodule of well-marked hepatization in their centre. In two instances only, one in a dog at the end of forty-eight hours, (the time of death of the other was not noted,) where the lungs were covered with ecchymoses, in several of them were found a circumscribed purulent deposit, (noyau purulent circonscrit,) identical with those met with in man. In both cases there was likewise effusion of serum into the cavity of the pleura.

In none of these instances, however, were any other effects or symptoms produced than those dependent on the local inflammation, i. e. of the lungs. There were none of the terrible symptoms which indicate a more profound affection of the system—there was disease but no diathesis.

These effects, then, correspond to those produced by the injection of quicksilver by Cruveilhier and Gaspard, of charcoal in powder by Magendie, of cerebral substance by Dupuy, of the blood of the slug by Gaspard, of particles of gold by D'Arcet himself. And he therefore attributes them to a common cause, the insoluble, amorphous, and pulverulent nature of the substances injected rendering them incapable of elimination, and, from their size, of circulating in the capillaries. All these substances, when injected, produced no other results than local lobular inflammation of various organs, without other symptoms than those of pure phlegmonous inflammation.

The effects of the injection of the *second product* of the spontaneous decomposition of pus, of the yellowish-green putrid fluid, freed from all insoluble matters, were very different.   Hiccup, vomiting, diarrhœa, rigors, fever, dyspnœa, opened the scene, followed by the most marked adynamic state, depression, stupor, involuntary evacuation of urine and fæces, pale appearance of the mucous membrane, different hemorrhages, abdominal pains, and the most complete prostration, and death in five hours.   On dissection, the lungs were found of a violet colour, infiltrated and indurated, as in œdema, their surface covered with small spots of sub-pleural and inter-lobular ecchymosis. Similar ecchymoses existed on the spleen, liver, and intestines ; the inner membrane of the aorta was reddened ; the blood fluid, black, greenish, containing grumous portions, which broke down under the fingers, without communicating the sensation of fibrin.   These alterations, our author remarks, display a general malady, one of the whole system, one by which the life of all the organs is destroyed, instead of death from the interruption of a single function. It is no longer a disease but a diathesis—the liquid injected acting like a leaven has communicated its poisonous and deleterious properties to the entire blood.

If we inject *healthy pus*, before it has undergone any decomposition from exposure to the air or oxygen, we by no means so frequently produce purulent deposits, as has been by some asserted. Out of eleven or twelve experiments, M. D'Arcet only twice succeeded in obtaining this result ; in the majority of instances the putrid symptoms alone supervened.

Supposing that this failure might depend on human pus having been injected, he put setons into the dog and rabbit, and injected the pus so obtained, but without any difference in the effects.

With the results of these experiments upon animals before him, M. D'Arcet then proceeds to draw a parallel between them and those observed in man, and having established their entire correspondence, comes to the conclusion that the disease called *purulent absorption, phlebitis, purulent infection, purulent diathesis*, is a complex malady, where two very distinct classes of phenomena are observable, but which occur so combined, that hitherto they have been confounded together.   These phenomena are:

1. A disease of the respiratory, hepatic, or other organs ; a local inflammation, dependent on a mechanical cause, the capillary tissue being embarrassed by insoluble or pulverulent principles developed in the pus by its exposure to the oxygen of the air (in the lungs), and not producing other constitutional effects than those of phlegmonous inflammations of the same organs.

2. A miasmatic poisoning, caused by the absorption and circulation of some principles of the pus itself become putrid, acting on the blood in a special manner, and producing grave general symptoms, especially characterized as adynamic, and such as indicate a class of diseases, where the entire organization is intimately deranged, as the plague, typhus fever, purpura, glanders, &c.

The explanation given of the origin and mechanism of these two effects is this.   Purulent matter, being mixed and circulating with the blood, reaches the lungs, and being there exposed to the action of oxygen, undergoes such changes as would happen to it, as an unorganized substance,

out of the body. Its elements separate into two parts, the globules ab-
sorbing oxygen, increase in size by their reunion, and become incapable
of traversing the capillaries, the caliber of which they obstruct, in the
same way as mercury, gold, or charcoal, and thus produce those series of
phenomena which result from those substances being introduced into the
circulation. The liquid part, under the same influence, acquires putrid
properties, which produce the effects above described, effects absolutely
identical with those occurring from the simultaneous circulation of blood
and putrid matter. Having given this explanation, our author adds, that
he thinks it is impossible to admit that pus, in substance, can be absorbed
by the capillaries; the laws of endosmosis applying, as they do, only to
soluble substances, do not allow this. But although the passage of pus
itself does not take place, that of the purulent serosity, deprived of its
globules, readily does so, and hence, in addition to inoculation strictly
so called, there is another road opened for putridity entering the system.

The disappearance, by absorption, of collections of matter, or abscesses,
without any remarkable disturbance of the system, is next alluded to.
M. D'Arcet allows the fact, and endeavours to account for it. Having
observed in several cases where purulent deposits had existed, as ascer-
tained by dissection, that during life the urine was albuminous, he was
led to infer that in cases where abscesses dispersed without bad conse-
quences, this might also be the case; and he relates two instances (in
man) in which he had an opportunity of observing and ascertaining that
whilst the tumours were dispersing the urine became albuminous. But
although this accounts for the serous portion of pus with its albumen,
which indeed forms by far the largest part of it, what becomes of the pus-
globules? Referring to the observations of Dupuytren, we believe that
these remain in the part, and constitute the greasy, putty-like substance
met with by that distinguished surgeon and others, in the seat of chronic
abscesses which had spontaneously disappeared.

ART. XII.

1. *Essays on the Philosophy of Vitality, as contradistinguished from
   Chemical and Mechanical Philosophy, and on the modus operandi of
   Remedial Agents.* By MARTYN PAINE, A.M. M.D., Professor of the
   Institutes of Medicine and Materia Medica in the University of New
   York, &c. &c.—*New York*, 1842. 8vo, pp. 70.
2. *The Cyclopædia of Anatomy and Physiology.* Edited by ROBERT
   B. TODD, M.D. F.R.S., Professor of General Anatomy and Physiology in
   King's College, London—Article *"Life,"* by WILLIAM B. CARPENTER,
   M.D., Lecturer on Physiology in the Bristol Medical School.—*London*,
   1840. 8vo, pp. 20.

THE usual personalities directed against us, which the first of these
pamphlets contains, would not alone prompt our notice of it; since we have
no inclination to carry on a contest with an adversary who cannot give us
the credit either of gentlemanly feeling, or honesty of purpose. We shall
take the opportunity, however, of briefly noting the present state of the

questions at issue between us; for the information of such of our readers
as care to learn it, without wading through the numerous pages in which
it is mystified—and misty-fied—by Dr. Paine. The learned gentleman and
ourselves were on the best possible terms, until the unlucky hour when
we unfavorably reviewed his Commentaries. This is evident, from the
very complimentary testimonial he had given in favour of our Journal,
not long before that review appeared;* and from the frequent and gra-
tifying allusions he makes in his Commentaries to various preceding
articles in it.   We could have had no other motive, then, but a sense of
justice, in passing upon it the verdict we did.   Pledged as we are to the
public, to do justice without fear or favour, we used towards Dr. Paine
the same impartiality which we have exercised with reference to indi-
viduals who rank far above him as medical philosophers; and that the
opinion we expressed was not an exception to the general verdict of the
well-informed part of the profession, is apparent from the fact, that
reviews equally unfavorable, some even more unfavorable, appeared
in various other most respectable journals of this country, Germany, and
America.   From his first glance at our review, the whole current of
Dr. Paine's thoughts towards us seemed to be changed.   Instantly,
as if "perplexed in the extreme" like Othello, in his jaundiced
apprehension

> " *Our* name, that was as fresh
> As Dian's visage, is now begrimed and black."

We are no longer the able and impartial journalists we once were; but scarcely
any language is strong enough to express the grossness of our misrepresen-
tations, the darkness of our ignorance, the depth of our malignity.   And
yet we think our readers will not have perceived any such change in the
tone of our journal as may confirm Dr. Paine's imputations; and may
possibly incline to think that the change is solely in his own mind, and that
his wounded vanity has a large share in producing it.   To Dr. Paine's ex-
position of our errors of criticism, we have made no reply, and do not
intend to make any; simply because if any of his statements are to be
answered, the whole must be; and as Dr. Paine's *Examen* of our review
was about four times the bulk of the original, our *Examen* of his *Examen*
would be swollen from an overgrown pamphlet into a goodly volume, the
production of which would involve an amount of trouble which *we* do not
consider at all commensurate with the importance of the subject—being
satisfied that, as Dr. Paine's bulky pamphlet has been but little read, our

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* As the record of a rare psychological phenomenon, when taken in conjunction with
the subsequent denouncements of the writer, we here give permanency to the document
referred to; it may hereafter be useful to the metaphysical inquirer.

"*New York; August* 19, 1840.

"The subscriber, having read with attention the British and Foreign Medical Review
as far as published, would commend this journal to such of his professional brethren as
may not be familiar with its merits, as abounding with the latest information upon medical
topics and collateral branches, gleaned from all parts where knowledge is cultivated. The
critical articles are of the highest order; emanating from erudite genius, liberal and
generous, yet devoted to the paramount interests of science. Its range of observation is
so extensive, and its critical articles so elaborate, it may be said, without interfering with
the interests of other medical periodicals at home and abroad, that this journal is indis-
pensable to all who would most improve their acquaintance with philosophical medicine,
or practice the art in its most rational aspects.

"Martyn Paine, m.d."

volume would excite still less attention, and that our readers will form
their judgment of the validity of Dr. Paine's charges, rather from our
general character for impartiality and competent knowledge of the sub-
jects we treat of, than from an investigation of their details.   To *either*
source of judgment, however, we fearlessly appeal.

Dr. Paine's " Examination," however, contained a specific charge,
totally distinct from those relating to himself, (though he has done his
best to mix the two together,) seriously implicating the character of a
gentleman known to be connected with this Journal.   This being placed
in a form adapted to strike the eye of every one who opened the pamphlet,
gained very extensive currency ; and, from certain internal probabilities,
as well as from the very artful mode in which the evidence was brought
forwards by Dr. Paine, the charge was readily credited by those who
were not acquainted with the personal character of the individual attacked.
He gave it at once, however, a positive denial; and appealed to the
Editor of this Journal for his confirmation.   That confirmation was given
promptly and without the slightest reservation, because there was nothing
to reserve.   The charge was admitted to be true in regard to the writer
of a certain *Review* (that of Hunter's works) in this Journal; but that
writer was *not* the individual to whom it was attributed by Dr. Paine.   And
although it may suit Dr. Paine's purpose to treat these counter-statements
with a sneer, and to trust more to his own dogmatic *assumptions*, than to
the positive assertions of two individuals of respectable name, regarding a
matter of which they alone can *know* the real truth, we feel sufficiently
confident of the good feeling and candid judgment of our professional
brethren to leave the matter in their hands, without taking the trouble
to produce that further evidence of the falsity of Dr. Paine's charge,
which it would be easy for us to obtain.   We shall only add that the
assertion which Dr. Paine gives in his preface to the present treatise, on
the information of a " sure source in Europe, that Dr. Forbes has stated
that Dr. Carpenter wrote a part of the review of my Commentaries, and
the plagiarist the other part," is as false as Dr. Paine's other assertions
on the same subject ; since Dr. Forbes *never* has made any such state-
ment, for the very simple reason that he *never could* have made it, the
fact being quite otherwise.*

With these remarks we shall close the controversy, so far as *we* are
concerned.   Dr. Paine may continue his attacks upon us, as long as he
finds it conducive to his reputation, or beneficial to his pocket, to do
so ; but we believe that we shall consult our own best interests by leaving
them unanswered.

We shall now proceed to examine the scientific portion of Dr. Paine's
volume, which we are the more willing to do, inasmuch as we do not recol-
lect any previous occasion on which we have given a formal exposition of

* We will just acquaint Dr. Paine with a small fact, (" these little things are great to
little men,") which may gratify him as helping to explain some of his odd mistakes and
strange flounderings about the truth, in his early as well as in his later reclamations, and
the withholding of which at the time was, we fear, partly owing to our wicked indulgence
of the Lucretian satisfaction (*Suave mare magnum*, &c.) of witnessing in safety from our
editorial watch-tower his dangerous and unwieldy gambols on the sea of criticism; it is
this : the *Article* in which the plagiarism appeared was composed of *three* papers,
written by *two* different persons, united into *one article* by the editor.   Dr. Paine seems
marvellously ignorant of the universally known *secrets* of journalism. — ED.

our views on the " Philosophy of Vitality." Agreeing as we do on this subject with the author of the second of the treatises of which the titles head this article, we consider that our object may be best accomplished by giving a brief analysis of his views; and by then inquiring how far Dr. Paine's representations of them, or strictures upon them, are well founded.

Every physiological writer is entitled to give his definition of LIFE; since it is impossible to conduct any reasoning upon a subject of such abstract character, unless the precise meaning of the terms employed be fixed at starting. The definition here given by Dr. Carpenter has special reference to the definition of the term DEATH, given by Dr. Symonds in a former number of the same Cyclopædia, and is designed to be antagonistic of it. As death is the condition of an organized body in which its distinguishing properties have been abolished, and its peculiar actions have ceased, so life is " the state of action peculiar to an organized body or organism." Between these two conditions, is that state in which there is no obvious functional activity; yet the peculiar properties of the organism are not absent, and only need the requisite stimuli to call them into operation: this is the condition of the seed and of the torpid animal; and it is designated by Dr. Carpenter as that of *dormant vitality*. We will not say that this definition of life is incapable of improvement; but we do not see how it can be made more precise, without involving a great extension of its terms. It depends upon the known acceptation of the words " organized body or organism;" and as these are not subject (so far as we are aware,) to any doubt, we need not commence our exposition by a discussion of their meaning.

No one in his senses can fail to perceive the striking differences between the actions of organized beings, and those of brute matter. The phenomena of sensation, thought, and spontaneous movement, which are exhibited by animals alone, are obviously of a character totally distinct from any which we witness in the inorganic world; and the acts of nutrition and reproduction, which are common to all classes of living beings, have but a very remote analogy, if any, to the physical or chemical operations of inanimate bodies. But these phenomena are to be studied *in the same manner* as those of physics or chemistry; that is, we must apply to them the principles of the inductive philosophy; and, by the collection and comparison of instances, must strive to refer them to general principles or laws. But when we speak of such general principles or laws, which we regard as the ultimate facts of science (as for instance the principle or law of gravitation), we must carefully bear in mind that nothing more is meant by them, than concise expressions of the mode in which the Creator operates on matter,—expressions which at once imply the uniformity of the operation and the universality of its extent. Thus the law of gravitation, the most general yet discovered, is merely an expression of the fact that, under all circumstances whatever, masses of matter have an attraction for each other in direct proportion to their bulks, and in the inverse ratio of the square of their distance. This law, then, is founded on a property which pervades all matter, and is essentially connected in our minds with the idea of materiality. The property can only manifest itself, however, when certain conditions of action are supplied; thus, if only one mass of matter existed in the universe, we should not

be cognizant that it possessed the power of attracting another. A similar illustration may be drawn from physiology. There is a certain peculiar form of tissue, to which we give the name of muscular fibre; and this tissue possesses the property of contracting upon the application of particular stimuli, provided certain conditions are supplied. This property is so essential to our idea of the substance known as muscular fibre, that even if we were to find a tissue (which we do in no instance,) apparently presenting all its external characters, but destitute of this property, we should at once conclude that it must differ in some essential particular of its structure and composition from real muscle. Further, we do not find this property existing in any tissue which does not possess the particular structure which we denominate muscular; and we never find it lost by the structure which once possessed it, until the cessation of the supply of arterial blood deprives it of one of the conditions necessary for the manifestation of its property; or unless an alteration in its nutrition, or incipient decay, have produced a change in its structure or composition. Hence the idea of contraction on the application of a stimulus, is associated in our minds with that organized fabric which we term muscular fibre; just as explosive power, on the application of flame, is associated with that mixture of sulphur, charcoal, and nitre, which we call gunpowder. An amount of decomposition inappreciable by our present means of observation may destroy the contractility of muscle; just as a very small amount of dampness, the existence of which we might only know by its effects, impairs the combustibility of gunpowder. But there is this fundamental difference between the two cases, which at once proves that there is no further relation between them than one of analogy. The explosive force of gunpowder is produced by the mode in which its different components act upon one another, when flame is applied, according to principles strictly *chemical*;—the chemist makes the mixture, and adjusts the proportions in such a manner as to produce the most advantageous result, by the known tendency of the ingredients to form certain new combinations according to definite proportions. But no chemical admixture of ingredients, nor any structural arrangement of them that the physical philosopher might devise, could produce a tissue that would contract on the application of a stimulus. In its origin muscular fibre is entirely distinct from any inorganic compound, for it can only be generated by a living organism; and it is thus equally alien, in its structure and its properties, from any possible aggregation of inorganic matter. Hence to its structure we apply the term *organized*, indicative of that peculiar arrangement, which we never see in brute matter, and which we know, from experience, can only be given by the action of a pre-existing organism; and to its properties we give the term *vital*, indicative of a class, or category, entirely distinct from physical or chemical, as these are from each other. In the same manner we might proceed in regard to all the other tissues of the living body; we should find that each has its peculiar structure and peculiar properties; and that certain vital properties are inseparably connected with certain forms of organized tissue. True it is that we find different modifications of the same kind of property possessed by tissues *apparently* the same; as, for example, the secreting cells of one gland do not present any obvious differences from those of another, though their products are so unlike; or we find some cells

undergoing transformation into nervous tissue, whilst others, not at first distinguishable from them, are changed into muscular fibre.   But will any microscopist or chemist be bold enough to say, that he is so cognizant of *all* the characters presented by these several tissues, as to feel certain of their identity of structure and composition ?   We should hope not.

We have heard of no physiologist of modern times possessing any claim to scientific distinction, who does not fully recognize the existence of a set of *vital* properties, totally distinct from those of a physical or chemical nature, and exhibited only by *organized* structures.   In our estimation, no absurdity could be greater than to deny them; and we challenge Dr. Paine, or any other captious *hyper-vitalist*, to prove that we have ever done so ; not by select sentences isolated from their context and pieced together so as to present a meaning quite contrary to that which they were intended to convey; but by legitimate quotations.

But there are many shades of opinion amongst physiologists, as to the first origin of these vital properties ; and as to the greater or less exclusiveness of their operation in the living body.   Each of these questions we shall briefly notice.

First, then, as to the origin of vital properties.   We see these so inseparably connected with particular forms of structure,—the properties never being manifested without the structure, and the structure never existing in its perfect state, and in its normal conditions, without the properties,—that no reasonable ground can be assigned for attributing vital properties to anything else than that peculiar structural arrangement, and that peculiar union of elements, which characterize the tissue exhibiting them.   There is here a strong *analogy*, then, to the production of a new and peculiar set of properties in a piece of mechanism or in a chemical compound, by a certain disposition of elements ; but it is *only* an analogy, since the conditions requisite for the production of an organized tissue are, as already shown, of a new and peculiar character. Still the analogy is important in this,—that, as we do not consider it necessary to imagine the separate existence of an *elastic principle* which is imparted to steel when tempered in a peculiar way,—or of a *saline principle* which is imparted to muriatic acid and soda in the act of their combination,—so there is no necessity to infer the existence of a *vital principle*, because a tissue formed in a peculiar manner possesses peculiar properties.   And upon the logical principle of avoiding unnecessary hypotheses, we cannot but do wrong in making such an assumption.   For we may consider it as a law of the Creator, equally constant in its operation with any of those already alluded to, that the act of organization, or the production of an organized structure out of an amorphous *plasma*, does generate or develope certain properties, which are as closely related to the structure as elasticity is to blue-tempered steel, or saline taste to muriate of soda.   If there be not such laws of uniform operation in physiology, we know not what hope there is of ever raising it in the scale of sciences.

Now if the validity of this reasoning be admitted, there is only one step further back to be made, towards what we regard as the true theory of the vital properties.   If the peculiar properties possessed by a certain tissue are to be attributed to that peculiarity of its structure and composition, which is termed its organization, we must attribute the capability

of undergoing this organization to the elements of which it is composed; in other words, we must regard them as possessing *vital* properties in a dormant or inactive condition, just as they possess *physical* and *chemical* properties, which do not manifest themselves until the requisite conditions are supplied. Thus we know by experience, that oxygen is a supporter of combustion; but who would have learned this from its sensible properties, or from the mode in which it is generated? We know from experience that iron is capable of being rendered magnetic; and yet for how many ages had mankind been using iron before this capability was discovered, simply because the requisite conditions for its manifestation were not supplied? Just in the same manner, we know that oxygen, hydrogen, carbon, and nitrogen, united in a peculiar mode, produce a compound having peculiar properties, of which we should not have guessed the existence if we had not learned them by experience; the mode of union is peculiar, and not imitable by the physical or chemical philosopher; the properties are also peculiar, but they are not less the result of that act of combination and arrangement. We think it a strictly logical deduction, then, that all those forms of matter which enter into the composition of an organized body possess vital properties, which, like any other properties, manifest themselves as soon as the requisite conditions are supplied. To this view Liebig has recently been led, as we pointed out in our last volume, (p. 496,) by a train of reasoning which was doubtless original with himself, although by no means new to us; and, as he justly remarks, " it takes from the vital phenomena nothing of their wonderful peculiarity, whilst it may be considered as a starting point from which an investigation into these phenomena and the laws which regulate them may be commenced."

If the train of reasoning we have just sketched be correct, and some very able logicians have expressed their inability to detect any flaw in it, the development of a living organism from a germ is the necessary result of the vital properties of that germ, which enable it to assimilate and organize the nutriment supplied to it, and thus to call into operation the properties which were previously dormant in its elements; and the whole maintenance of that organism is an action of the same kind, involving as it does a continual appropriation of fresh nutriment to repair its waste, a continual production of fresh tissue in place of that which has undergone decay, and therefore a continual development of vital properties, whose actions shall replace those which have ceased from the loss of the necessary conditions. But whence the vital properties of the germ? They are derived from the parent that produced it. There is something most wonderful, we admit, in the fact, that the mere nucleus of a cell, placed in a certain position favorable to its evolution, should become a moving, feeling, thinking being: but the phenomenon is only more wonderful in degree, not in kind, than the growth of the first simple cell, which may remain as the humble fungus, from a similar germ. Both are instances of the operation of properties purely vital, according to laws which must have been impressed on the material elements concerned, at the time when they were first called into existence by the *fiat* of their Creator. Dr. Paine makes an extraordinary use of the doctrines entertained by Dr. Prichard and Dr. Carpenter on this subject, which leads us to suppose that his opinions on the divine agency are very peculiar. Thus he

states that " both of these writers see so much of peculiar design in or-
ganic nature, that they find it impossible to interpret the phenomena of
organic beings upon the chemical and physical principles which they
have so strenuously put forth, and in the end assign them to the *imme-
diate* action of the Deity." After two quotations from Dr. Prichard, he
continues : " This is a far greater admission than the vitalist can desire,
since, if the development and growth of the germ depend immediately
upon Almighty Power, so must all the analogous processes of the living
being at all stages of its existence. But whilst this doctrine is utterly
exclusive of all the assumed chemical agencies at all periods of life, and
overlooks the analogy between the development of the germ and the sub-
sequent processes, there can be no hesitation as to the disposition which
should be made of it, without any reference to its prevaricating nature."
So then, according to Dr. Paine, to acknowledge the immediate agency
of the Deity in any class of phenomena, is to remove them from the pale
of chemical and physical laws ; or to say that vital phenomena are the
results of the immediate action of the Deity, is to affirm that they are
not under the dominion of laws analogous to (but not identical with)
those of physics and chemistry : as if these laws were in *any* case aught
else than expressions of the mode in which the Creator is constantly and
immediately operating on every particle of matter in the universe. Dr.
Prichard's object is to show that there is no *intermediate agent*, inter-
posed between the Deity and the living organism, any more than there
is an agent governing the solar system or any other example equally
indicative of design in its adjustment and of foreknown harmony in its
operation ; and the same line of argument has been carried out, as we
think successfully, by Dr. Carpenter. (See Brit. and For. Med. Rev.,
vol. VII. p. 172.)

We briefly sum up this portion of the subject, therefore, by affirming
our belief that, as there are certain properties of matter, which operate
in a certain uniform manner, (or according to certain laws,) to produce
the class of phenomena which we ordinarily designate as physical,—and
as there are certain other properties which act in *their* peculiar manner
to produce chemical phenomena—so there is another class, restricted to
particular elements, which, when operating under certain required condi-
tions, produce vital phenomena. All these phenomena, resulting from
the action of properties essential to the constitution of the several forms
of matter, according to laws pre-determined by the Deity, are equally
the results of His agency ; and nothing is to be gained by imagining
that there is any delegation to inferior or secondary powers. Such dele-
gation must be understood, if the term *vital principle* be employed in any
other sense than as a comprehensive expression of the vital properties of
the organism.

II. The question that remains for consideration relates to the extent
to which the operations of the living organism are the result of its
purely *vital* properties ; or how far the *chemical* and *physical* pro-
perties of its materials are concerned in its actions. To deny that the
latter participate in them would seem to us the height of absurdity. Is
the force generated by the vital contractility of the muscle, applied in
moving the bone, on any other than strictly mechanical principles? Or
does the movement of the blood through the large vessels take place in

a mode different from that in which a similar fluid would move in an apparatus of inorganic tubes similarly constructed, and under the influence of forces similarly applied, although generated by a piece of human mechanism? Or do an acid and alkali brought together in the stomach neutralize each other less *there* than anywhere else? We cannot conceive of any hesitation in the reply to such questions. How far, then, do physics and chemistry take a share in the maintenance of the life of the organism? With regard to chemistry, we briefly expressed an opinion, in our review of Liebig's work, which appears to us to embody the whole principle of the matter; and as it is brief, we shall introduce it here with the addition of one or two illustrations. " Chemistry may fairly take cognizance of all those processes by which the vegetative functions of the living organism are brought into relation with the world around. It may on the one hand trace the conversion of the alimentary materials into organizable products; but there it ends: it can throw no light on the process of organization, or upon the new (vital) properties which are called forth by it. On the other hand, it can take up the same materials, in the act of being restored to the inorganic world by the metamorphosis of the tissues; and it may give an account of all the changes which the materials undergo up to the time when they are finally cast off by some of the excretory processes. But of the *vital* functions of organized tissues, which it is the peculiar province of the physiologist to investigate, chemistry can give no account whatever." Thus, the plant takes up from the soil and from the atmosphere three binary compounds— water, carbonic acid, and ammonia, besides certain mineral ingredients which we need not at present consider. Out of these it elaborates certain ternary compounds destitute of azote—as gum, sugar, and oil; and certain quarternary compounds containing azote, and identical in composition with the albumen and fibrin of animals. Now it is a well-ascertained fact, that the *tissues* of plants are composed of the non-azotized compounds only, which are formed by all vegetables; whilst the azotized products are merely deposited in the cells and lacunæ of the fabric. Gum may be regarded as the organizable principle of plants; for the sugar and oily matter which they largely contain, seem to pass through the condition of gum before they can be converted into organized tissue. These principles are well known to have strong chemical relations; so that we can convert either gum, starch (which is gum undergoing organization), or even organized tissue, into sugar, by chemical agencies only. Now we do not entertain much doubt, that they will in time be found capable of being formed by the union of their elements; indeed with regard to fatty matter this has already been accomplished. But the conversion of any of them into an organized tissue, possessed of vital properties, is a change which can only be effected by a previously-existing organism in a state of vital activity. Again, the azotized products found largely in certain plants, are not, so far as they are concerned, organizable principles, but are rather to be considered as secretions; for there is no evidence that they ever enter into the composition of vegetable tissue. In regard to these also, we think no one is warranted in affirming that they are aught else than chemical compounds; or that, if we knew the precise mode in which their elements are brought together, and could imitate it, we should be unable to obtain the same

product.   Now these azotized compounds secreted by plants are the organizable principles of animals, being used by them as the materials for the construction of their tissues.   There is no evidence that the non-azotized compounds of plants which are taken into the animal system ever undergo organization ; they are destined either to sustain the respiration, or to be cast off by other secretions, or to be deposited as fatty matter.

The process of digestion is nothing else, in our view, than the chemical reduction of these two classes of principles to a form in which they can be most readily absorbed and applied to the purposes of the economy ; and we believe that there are few, if any, intelligent physiologists (we are sorry that we cannot include Dr. Paine in this category) who do not entertain the same opinion.   Dr. Paine asked rather triumphantly, in his " Commentaries," whether albumen had ever been produced by artificial digestion.   We are now in a position to give him a more positive reply than we could at that time offer ;—namely, that albumen is not *produced* in natural digestion, being merely *reduced,* from the solid condition in which it existed in the articles of food taken into the stomach, to the fluid form ; and that this reduction may be effected by artificial, as completely as by natural digestion, although with less rapidity, because it is impossible exactly to imitate all the physical and chemical operations to which the food is subjected in the stomach.   We believe, therefore, that the operations of vitality commence only with the absorption of the alimentary materials thus prepared.   The albumen is gradually converted, under the influence of the living tissues over which it passes, into the semi-vitalized fibrin ; and this is converted, under the same influence, into the various solid tissues possessed of their respective vital properties. This conversion is an act of vitality alone, which physics and chemistry have nothing to do with, otherwise than as furnishing the materials for it.   When these tissues have performed their appointed functions, and lived out their assigned period, they undergo decay ; and their products are partly destined to be thrown off by secretion, and partly (we are inclined to believe) again to contribute to the nutrition of the system ; the portions fit for the latter purpose being taken up and conveyed back into the circulation by the lymphatic system.   Now that the products of excretion are capable of being formed by chemical agencies alone, may be inferred from the well-known fact that urea has been artificially generated by the union of its components.   The objection which might for some time have been brought against such a statement,— namely, that *cyanogen*, which is essentially concerned in this manufacture, is, though a binary compound, only procurable by the decomposition of animal tissue, and that any compound into which it may enter is still, in some sense, of an organic nature,—has been recently removed by the artificial production of this substance from its elements, carbon and nitrogen.

We trust that we have now stated our views on this subject with sufficient precision to render it unnecessary to dilate further upon them. We have shown that as the physical and chemical sciences are concerned with two classes of properties of matter (which, so far as we at present know, are distinct from each other,) the science of physiology is essentially different from either of them, in that it is based on the operation of a set of properties, not possessed by all elementary substances, and only manifested under certain peculiar conditions, belonging therefore to a

category entirely distinct, to which we give the appellation of vital. But as in the operation of any complex piece of mechanism of human construction, such as the steam-engine, we find a variety of principles, chemical and physical, brought into action with one common end,—so in the living organism (constituting as it does but a part of the great system of the universe, subjected to its laws, and unable to exist but by its various relations with the inorganic world around,) there is a like combination of physical, chemical, and vital operations, having all one common purpose, and mutually adjusted by the all-wise Designer, in such a manner as to harmonise with each other in maintaining that state of activity of the entire system which is called its Life.

We shall now offer a few remarks on Dr. Paine's Treatise, some quotations from which will, we think, satisfy our readers as to its object and merits.   The following is from the preface.

" The tendency of the labours now in progress in organic chemistry, to the subversion of physiological science, and therefore of pathological and therapeutical principles, and, as another necessary consequence, of rational practice, induces me to persevere in contributing my humble efforts to counteract the influence of the iatro-chemical philosophers.   However laudable may be their motives, and however they may astonish us with revelations in inorganic chemistry, and multiply the sources of human happiness, they are nevertheless employed, in their interpretation of 'facts' relative to organic chemistry, in opposition to the experimental results which have been for ever in undeviating progress in every individual of the organic kingdoms. The enchantments, however, of a fascinating pursuit, and an imperfect acquaintance with those profound institutions of nature which are entirely foreign to the laboratory, and which can only be known through the accumulated inquiries of ages into both the natural and morbid phenomena of organic beings, must be allowed the weight of an apology.   But an attempt to overthrow the experience of the past, and to obscure what is written in the most legible characters, and, as it were, in thousands of languages, upon the tablets of organic life, by a distorted construction of '*facts*,' which are yielded by test-glasses and crucibles, appears to me to be an enterprise which should alarm physiologists as to its pernicious consequences. That we are on the eve of some vast convulsion in physiology can no more be doubted, by those who watch the signs of the times, than that the declaration has been promulgated, *ex cathedrâ*, that 'medicine is now in its infancy,' or that efforts were made to establish a spurious system upon that assumption." (p. vi.)

Dr. Paine seems to forget that "truth never can be opposed to truth;" and that the inductions of organic chemists, respecting some of the phenomena which occur in the living organism, *may possibly* be more correct than *his* interpretation of the "experimental results which have been for ever in undeviating progress in every individual of the organic kingdoms." A man who sets out with the confidence that he must be right, and that every one who differs from him must be wrong, is not the sort of guide we should select in the investigation of the relative bearings of organic chemistry and physiology.

The professed object of Dr. Paine's first essay,—that on vitality as contradistinguished from chemical and mechanical philosophy,—is to state " some original views relative to the doctrines of life, as contradistinguished from those which respect inorganic nature. These doctrines lie at the foundation of all medical philosophy, of all practical medicine." This he does on the following plan :

" I shall proceed, in the first place, to carry out the illustration of an impor-

tant and fundamental principle of nature, as briefly set forth in my 'Examination of Reviews.' This exposition consists in a deduction of the doctrines of the vitalists from the phenomena that attend the development of the incubated egg. It is also one of my present objects to extend the application of the foregoing principle, and to consider—

" 1st. The constitutional nature of the ovum.

" 2d. To show farther by the philosophy of generation, and by the nature of the powers which are universally admitted to be alone concerned in developing the germ or ovum, and in forming the organs of the new being, that the *same* powers are, also, *alone* concerned in carrying on for ever afterwards the processes of life, and, of course, that no new powers, or principles, are introduced.

" 3d. To consider the manner in which the germ is impregnated, or its vital properties so stimulated into action, as to result in the development of the germ and in unfolding the various attributes of the new being.

" 4th. To show that we may find in the physiology of generation, or the principles through which the ovum is impregnated, the whole philosophy of organic life, or the principles through which the actions of life are for ever carried on.

" 5th. To state the manner in which the natural peculiarities of each parent, whether as it respects the properties of life, or the physical conformation, are infused into the germ, and combined in the full-grown offspring.

" 6th. To show that hereditary diseases are transmitted in the same way as those more natural peculiarities which belong to parents.

" 7th. To show, also, that the principles which are concerned in the transmission of hereditary diseases are the same as concur in the production of ordinary diseases.

" 8th. To deduce from the philosophy of generation the vital nature of hereditary diseases; or in other words, to show that the morbid impression is established upon the vital properties of the ovum, and of course upon those of the new being; and that the hereditary vitiation does not consist in any transmitted impurity to the blood or other fluids of the offspring, as is now supposed by the humoralists, and the fallacy of which I have endeavoured to establish in my Essay on the 'Humoral Pathology.'" (pp. 10, 11.)

We have thus quoted a whole consecutive page of Dr. Paine's lucubrations, in order to prevent any possibility of that misconstruction from imperfect quotation, which we continually encounter in Dr. Paine's criticisms upon his opponents. We must now add, however, that having carefully examined the whole of the Essay, we have failed to discover in it the originality which its author claims; and that we conceive him to have been guided in the line of argument which he adopts, by the delusive conception, that those physiologists who admit the development of the germ to be the consequence of the vital power of the parent (and who does not?) are egregiously in error when they attribute *any* of the processes of the adult being to any other principles whatever. In other words, that, if we admit that organised tissues have vital properties at all, these vital properties must do *all* the work of the organism;—those physiologists being guilty of the most egregious inconsistency, who admit the existence of vital properties as distinct from physical and chemical, and yet imagine that the latter participate in any way in the production of the phenomenon of life. We could almost wish in our hearts that Dr. Paine were suffering under an inflamed leg, in order that he might, by himself experiencing the relief afforded by keeping the limb in the horizontal posture, be convinced that the circulation of the blood is influenced by the force of gravity. That we do not misrepresent his

opinions, is evident from the following sentence. " We have thus before us a peculiar order of powers by which the organic being is developed, fashioned, and for ever exclusively governed."   Among the adversaries, convicted by his searching comparisons of the most inconsistent and un-philosophical jumble of vitality and chemistry, are Müller, Liebig, Roget, Prout, and Carpenter ; the last of whom he styles, "the acknowledged head of the strictly chemical school of physiology,"—a distinction which Dr. Carpenter has, we believe, never courted, and cannot desire, since the existence of peculiar vital properties, and the limited operation of physical and chemical principles, is as distinctly stated in his writings, as in the present article.   " But there are none so blind," &c.

The only novel idea which we have encountered in this Essay, is Dr. Paine's comparison of the *germ* to the *gastric juice !* (p. 22.)   The fol-lowing are the assumed points of similarity. " 1. The germ is an organic fluid, and so is the gastric juice. 2. The germ possesses a ' creative force,' by which new matter from without is assimilated.   Here the analogy is very remarkable, since the gastric juice in bestowing the first vitalizing act upon dead matter must also be peculiarly creative."   The first reminds us of Fluellen's celebrated parallel, " There is a river in Macedon," &c.   We may dispose of it, however, by assuring Dr. Paine that he is mistaken in supposing the germ to be an organic fluid ; since it has been proved, by the aid of the microscope (which vies with the test-tube in its unfortunate tendency to disturb Dr. Paine's peace of mind by the revelation of new facts,) to be the nucleus of a cell ; and it has consequently no analogy whatever to the gastric juice.   With respect to the second of these comparisons, we simply deny that the gastric juice has any creative power analogous to that of the germ, because none has ever been proved to be manifested by it.

As a kind of Appendix to this Essay is an account of the conclusions derived by Dr. Paine from the presence of nitrogen in organic compounds. These conclusions are chiefly based upon misconceptions of sundry state-ments contained in Liebig's first work on Organic Chemistry, respecting the tendency of azotized compounds to undergo spontaneous decompo-sition.   These misconceptions seem chiefly the result of ignorance ; we can hardly suppose the perversion wilful.   Thus Dr. Paine asks, (p. 35,) " by what special art, when the chemist *creates* organic compounds, does he compel nitrogen to undergo a change of its natural character-istic, ' by which' (according to Liebig,) ' it evinces no particular attraction to any one of the simple bodies,' but an absolute repulsion ?"   The last clause is added by Dr. Paine ; and it is as contrary to well-known facts as it is to Liebig's real meaning.   For is it to be supposed that nitrogen has a repulsion for oxygen, when every electric discharge passed through a mixture of the two, causes them to unite into nitric acid ?   What was meant by Liebig was simply this,—that nitrogen has not an attraction for any one element in particular, so that its compounds are easily disturbed.   Thus nitric acid is readily deprived of part of its oxygen by anything that has a moderately strong affinity for the latter ; and chlorine passed through a solution of ammonia, will detach the nitrogen from the hydrogen, and form with it a new compound, which is again decomposed with violent explosion, whenever it is even brought into contact with oily matter. Hence the unstable nature of azotized compounds is familiar to the

inorganic chemist; and there is no more need to suppose the necessity of any peculiar force requisite to bring azote into union with other elements for the sake of producing an organic compound, than there is to imagine that the inorganic chemist requires it.   Moreover, the whole of Dr. Paine's argument, founded upon such erroneous assumptions, is refuted by the fact that the tissues of plants are not composed of azotized compounds.

The last Essay, on the Modus Operandi of Remedies, we only here notice as an exemplification of the probability of the advancement of medical science by Dr. Paine's lucubrations.   He affirms that "the partial absorption of certain remedies is only a contingent result, and has little or no agency in the physiological phenomena.   Their reputed absorption is greatly over-rated, often only imaginary, and sometimes misrepresented."   "Whatever is true of remedial agents, in this respect, is equally so of morbific."   Thus, to carry out Dr. Paine's principles, the transformation of gouty concretions of uric acid, under the influence of benzoic acid introduced into the stomach, into soluble hippuric acid, which is taken up and carried out of the system, is not an influence of chemical action resulting from the absorption of the benzoic acid and its conveyance to the seat of the deposit, but is merely an example of the operation of forces which (although the operation can be precisely imitated by the chemist, and was indeed suggested in his laboratory) are "transcendentally vital."   Of a verity these dogmas altogether transcend our poor comprehension; and it will not be on slight grounds that we shall again call the attention of our readers to such an involved concatenation of absurdities.

Art. XIII.

Medico-Chirurgical Transactions.   Vol. XXV.—*London*, 1842.   8vo, pp. 319.   With 7 Plates.

The papers in this volume are for the most part short, and scarcely open to criticism; but as they offer many points of considerable interest, we shall, according to custom, present our readers with a brief analysis of them.

i. *A case of cyanosis, depending upon transposition of the aorta and pulmonary artery,* by Dr. Walshe.   It is peculiarly interesting from the extreme rarity of the malformation, and is drawn up with a degree of precision and minuteness that is almost as seldom met with.   The subject was a male infant, aged ten months.   The leaden hue of the integuments was general, but the discoloration was particularly deep at the toes and extremities of the fingers, and also at the upper lip and inner canthi of the eyes.   The child died in a paroxysm of dyspnoea.   After death the blue discoloration greatly diminished, disappearing altogether from the lip and canthi.   Upon examination the position of the heart in the chest was found natural, but the apex was slightly twisted to the left, and was formed by the extremity of the right ventricle.   The right half of the organ lay anterior to the left.   The aorta rose from the right, and the pulmonary artery from the left ventricle.   There was no communication

between these two vessels, saving by the ductus arteriosus. The aorta gave off two subclavian and two carotid arteries from the upper border of the arch, and the two coronary arteries arose in the usual way. The ductus arteriosus opened into the aorta exactly opposite the origin of the left subclavian. The venæ cavæ entered the right auricle in the ordinary manner. The right auriculo-ventricular orifice had a mitral valve, and the left a tricuspid. The foramen ovale was perfectly open, and the right side of the heart had walls of a much greater thickness than the left. The whole organ was hypertrophous. The viscera generally, and the liver in particular, were larger than natural. The muscles and adipose system were defectively nourished, but not in an extraordinary degree. It is, therefore, quite evident that the nutrition of these parts may be carried on by almost entirely un-oxygenized blood, (for the quantity of red blood circulating in the arterial system must have been extremely small,) without any important deviation from the normal state, *when such a condition has existed from birth.* We strongly recommend a perusal of the paper.

II. *Case of aneurism of the ascending aorta, bursting into the right ventricle,* by Mr. BECK. Upon examination after death, (which was *not* sudden,) the heart was found hypertrophous. The right sinus of Valsalva was enlarged, and presented a round open communication between the aorta and the right ventricle, sufficiently large to admit the end of the little finger. The lining membrane of the right ventricle was of a white colour, and somewhat thickened; the valves were little changed from their natural state, but immediately beneath them lay the collapsed sac of an aneurism, resembling the end of a finger of a glove, about three-quarters of an inch in length, and having at its extremity a large ragged opening, with two small orifices at the side, the edges of all being worn and rounded, as if the blood had passed through them for some time. No coagulum was found in the sac. Immediately at the base of the sac there was a communication, the size of a goosequill, between the two ventricles.

The patient had been unable at any time to run or walk quickly any distance, without suffering from violent palpitation; but the severe symptoms, which terminated in death, did not commence until about five years before his decease. During life a continued and very superficial sawing sound, with tremor, was heard; it was loudest after the second sound, and was most distinct at the base of the heart near the sternum.

III. *On the structure and functions of the human placenta,* with a plate, by J. DALRYMPLE, Esq. The observations of this gentleman are chiefly corroborative of the description given by Weber. According to his views, the whole mass of the placenta is made up of innumerable ramifications of the umbilical arteries, terminating in beautifully coiled and convoluted capillaries, which form tufts or bouquets at various intervals, and finally become continuous with the umbilical vein. The vessels, and the tufts formed by the capillaries, are inclosed in prolongations of the chorion. The tufts are made up of villi, and each villus contains one tortuous capillary. The interstices between the vascular divisions and subdivisions are everywhere free, and communicate with each other. The supposed maternal cells of the placenta do not exist. Mr. Dalrymple

differs from Dr. Reid in some respects.   He nowhere observed the arteries
and veins so closely bound together as to constitute one undivided though
really double vessel, and he believes the " blunt extremities" adverted to
by that gentleman to be what he has called "villi."   He does not appear
to have noticed the reflexion of the inner membrane of the maternal venous
system upon the vessels of the embryo, which constitutes so interest-
ing a portion of Dr. Reid's discovery.   (See Br. and For. Med. Rev.
vol. XI. p. 540.)

IV. *On the relation between the symmetry and the diseases of the body*,
by JAMES PAGET.

X. *On diseases which affect corresponding parts of the body in a sym-
metrical manner*, by W. BUDD, M.D.

We shall throw together our notices of these two papers, because the
objects at which the writers of both aim are identical, viz. the proof "that
it is a law of the animal economy, that, when uninfluenced by disturbing
causes, all general or constitutional diseases affect equally and similarly
the corresponding parts of the two sides of the body."   And in attempt-
ing to make our readers acquainted with what is yet known respecting
this very curious subject, we shall first lay before them a few specimens
of the kind of facts which serve as the basis of this opinion, and then
expose to view the respective theories which our authors have formed
to explain the occurrence of such phenomena.

It has been frequently observed, that, when a joint has been found
diseased in one limb, the corresponding joint in the other limb has pre-
sented a similar affection.   Of this Mr. Paget narrates some remarkable
instances.   In the body of a woman fifty-one years old, in both elbow-
joints an irregularly triangular portion of cartilage had been removed from
the middle of the great sigmoid cavity of the ulna, and into each of these
spaces there had grown a process of synovial membrane and fat, which
accurately fitted into it.   Above each of these larger ulcerations there was
a smaller one.   In the two knee-joints of a woman of seventy the carti-
lages of the patella, femur, and head of tibia, were affected with the fibrous
degeneration in precisely the same extent and degree, and in each the
edges of the semilunar cartilages were similarly and equally affected by
the same disease.   Moreover, on each outer condyle there was a spot of
exactly the same form and size, from which the cartilage was completely
removed, and where the exposed and hardened bone formed a shallow de-
pression, into which a corresponding elevation on the top of each tibia
accurately fitted ; and, in a still more striking instance, both hip-joints of
a woman aged sixty-eight, who died of general dropsy, presented the fol-
lowing appearances : To the head of each femur was attached a similar
very slender shred of fibrous tissue, the remnant of the ligamentum teres;
on each there were similar small spots, from which the cartilage had been
removed ; and, still more, on the corresponding part of each neck of the
femur, there was a spot from which the investing fibrous tissue had been
absorbed by ulceration, leaving an aperture into which an irregular ele-
vation of bone had grown, the resemblance being so close that the naked
eye could scarcely detect any difference.

We have a very analogous class of facts in the distortions produced by
gout and rheumatism, which are often remarkably symmetrical, and of

which a particularly distinct example is figured by Dr. Budd ; in the appearances of divers congenital malformations; and in the cartilaginous growths to which the bones of the hands and feet are liable.   Ulcerations of the cornea from defective nutrition, syphilitic diseases of the eye, the phenomena of metastasis, the rapid passage of inflammation of the tonsils and Schneiderian membrane from one side to the other, and the distribution of atheromatous patches in corresponding parts of the arterial system, as shown by Bizot, are further examples of the same symmetrical tendency.   But by far the most numerous instances are to be drawn from the extensive catalogue of skin diseases, in many of which the eruption, on corresponding parts of the opposite limbs, presents an almost perfect similarity both in pattern and the number of spots, (vide pl. III).

Such being the nature of the evidence for the existence of this law, let us now direct our attention to the explanations of the phenomena adopted by our authors, and here we shall observe a close degree of resemblance.

Mr. Paget believes that there are at least three different conditions in which diseased changes are symmetrical, viz. 1. When these changes are the result of the gradual degeneration of the tissues in the course of time, or after their functions have ceased, or when, through some general disorder in the economy, the whole body fails of being duly nourished. Such are emaciation, the changes of old age, &c.   2. They are the result of a morbid condition of the blood, in which some new material bears a peculiar chemical or organic relation to the whole or a part of some symmetrically-arranged tissue or organ, so that when they come in contact, the mode of nutrition in the tissue is altered, or the new material is deposited in it.   And the changes are general or local, according as the similarity of the parts is perfect or partial.   To this class belong, rheumatism, gout, scrofula, cancer, &c.   3. They result from metastasis, either with or without a morbid condition of the blood. (p. 40).

Dr. Budd divides the whole into two principal groups, viz. 1, Deviations arising from original fault in the solids, as symmetrical monstrosities ; and 2, Those which originate in morbid states of the blood, which comprise by far the greater number, and may be subdivided into those which arise from morbid matters of special kind in that fluid, and those which depend on deficiency of its natural ingredients. (p. 161.) When morbid matter exists, he believes it is detained in the seat of each individual lesion, and is there held in affinity with the part affected, this affinity being so elective, that the symmetrical or analogous parts of opposite regions of the frame are singled out by it, to the exclusion of all others, however like to these in outward appearance.

The disturbing influences which so often prevent their peculiar effects are, according to Dr. Budd, febrile movement, lesion, or other material cause of organic change, and variations in the amount of the morbid matter itself.

It will be seen at once that there is little real difference here, and that both have to a certain extent adopted a modified humoral pathology, as essential for the elucidation of otherwise inexplicable phenomena, in which we believe they have adopted the most soundly philosophical views. We cannot forbear quoting one example brought forward by Dr. Budd, because it satisfactorily illustrates the production of symmetrical disease

by the agency of a substance introduced from without.   A case occurred in King's College Hospital, in which the free administration of iodide of potassium was followed on the fourth day by an extensive erythematous eruption, the patches being distributed on the limbs and trunk in a perfectly symmetrical manner. (p. 112.)

It would be premature to pronounce decisively upon a subject which is only just beginning to be opened up, but we have no hesitation in recording the favorable impression which the perusal of these two very interesting papers has produced upon our minds ; and we particularly recommend all who may be anxious to enter upon a most inviting field of investigation, to study with care the very elaborate production of Dr. Budd, which will serve them as an admirable guide.

V. *Case of extensive disease of the pancreas,* by J. A. WILSON, M.D. The subject of this case was a male, aged forty-one, who had been a free liver and had drunk much.   His symptoms were, constant pain in the epigastrium of long continuance, and occasional paroxysms of severe agony.   The suffering was greatest after taking food, and when he was in the recumbent posture.   The paroxysms were accompanied by headach, giddiness, and sickness, and he frequently vomited blood.   The fatal event was ushered in by a peculiarly severe attack of the epigastric pain, with shivering, intense headach and sickness.   Maniacal delirium supervened, and was succeeded by complete coma.   No organic disease could be detected during life, but upon examination after death the pancreas was found of smaller size than natural, and unusually hard in its texture, and its ducts were universally filled with a compact, white, earthy deposit, which on analysis was found to consist of nearly pure carbonate of lime, with a fibrinous nucleus of animal matter.   The spleen fell into a grumous pulp under slight pressure ; the liver was pale, soft, and friable, and the stomach and kidneys were healthy.   This is an extreme case of a very rare form of disease, and is well deserving of notice.   Our present knowledge of the functions of the pancreas is anything but satisfactory.

VI. *Remarks on typhus fever,* by J. BOSTOCK, M.D.   This short, but well-written paper, is the record of the views which Dr. Bostock has been led to adopt respecting the different forms of typhus, or perhaps more correctly, of continued fever, their mode of propagation and their treatment.   It is the result of a long and extensive experience, and as such merits attention ; but we do not find anything sufficiently novel to demand a place in these passing remarks.

VII. *Cases of laryngitis relieved by operation,* by JOHN WILSON, M.D. Four cases are related; in two the operation was successful, in the others it failed to effect a cure. Their chief value consists in showing, that if the operation be attempted at all, it should be done at an early period, before the lungs are irremediably disorganized.   The last case reads us another lesson upon the futility of surgical interference in croup.

VIII. This is by the same author, and contains an account of the illness and death of an entire family, consisting of six persons, under very peculiar circumstances.   The most prominent features in the sufferings of all

were, general soreness of the fleshy parts, and also of the joints, exquisite
sensibility of the skin, œdema, especially of the lower extremities,
diarrhœa, the secretions being very much disordered, alkaline urine, great
emaciation, (accompanied in some with a ravenous appetite,) and a
teasing, dry cough, which was particularly severe in the children before
the fatal event took place.   The mother complained of a cankery, and
one of the children of a metallic taste in the mouth, from which a watery
fluid was discharged.   The intellectual faculties were unimpaired.   They
appeared insensible to the influence of cold, for during severe nights of
winter they would scarcely endure the covering of a single sheet.

On examination after death, the appearances of disease in the ali-
mentary canal were altogether trifling; but in all, (excepting the mother,
whose death was hastened by puerperal fever,) the lungs were extensively
affected, their tissue being infiltrated with black blood.   The parts thus
disorganized presented the appearance of pulmonary apoplexy, with this
exception, that they were not circumscribed by healthy lung, the transi-
tion from the condensed to the permeable portions being gradual.   No
poison could be detected by chemical analysis, and the cause of death
was utterly unknown.   The father was an Italian, a manufacturer of
ultramarine.   He did not live happily with his wife.

ix. A very interesting *case of congenital cataract*, which had existed
for twenty-three years, and in which the patient acquired perfect vision
after operation.   It is related by the operator, Mr. Stafford.   This is the
longest period on record after which a cure was effected.   The patient in
Cheselden's case was thirteen years old, and in Mr. Ware's seven.

xi. *On cases of plague*, by M. Pezzoni, in a letter to Dr. Davy. The
object of this paper is to prove that the plague is really contagious; and
as the facts narrated appear to be authenticated in a satisfactory manner,
it deserves a careful perusal.

xii. *Observations on tubercle of the brain in children*, by P. Hennis
Green, m.b.   The data, upon which these observations are founded, are
drawn from the results of thirty cases, in which the symptoms were care-
fully observed during life, and the diseased appearances accurately noted
after death.   They are presented in a tabular form.   Of the whole num-
ber, fourteen were boys, and sixteen girls.   The ages varied from nine-
teen months to twelve years, the greatest number occurring between one
and four years.   In five cases there were no symptoms whatever of cere-
bral disorder; in three, headach was the only symptom during the chronic
stage; in one deafness, and in one purulent discharge from the ear.   In
the remaining twenty cases the symptoms were more complicated.

In the course of the disease two stages may generally be recognized, a
chronic and an *acute*.   Dr. Green considers that there are three classes
of symptoms presented during the chronic stage.   In the *first*, the disease
commences with headach, which, indeed, is the most common and cha-
racteristic of all the symptoms; it formed a prominent feature in seven-
teen of the twenty cases.   It is most usually frontal, is occasionally asso-
ciated with vomiting, and is followed by various lesions of sensibility or
of muscular power.   In the *second* class, the disease commences with

convulsions or epilepsy, which gradually terminate in paralysis. (A very interesting case of this kind forms the subject of the next paper, No. xiii, narrated by Mr. Dunn.) In the *third* class, paralysis of one or more muscles, or organs of sense, is the first symptom observed.

The symptoms of the *acute* stage are varied, but are generally more or less allied to those of hydrocephalus or ramollisement.

In eleven of the whole number of cases the tubercles were seated in the cerebral hemispheres, in nine they existed in the cerebellum, in seven they were found in both the cerebrum and cerebellum, and in two in the cerebellum and pons varolii. In Mr. Dunn's case they occupied the *surface* of the right cerebral hemisphere.

xiv. *Case of stricture of the trachea*, by Mr. W. C. WORTHINGTON. The disease was of a very chronic character, and appeared to have a syphilitic origin. The most prominent symptoms during life were, the peculiar noise attendant upon inspiration, and the painful effort required for its accomplishment. The noise precisely resembled that which is made by an unsound horse, called a roarer. Each inspiration occupied ten seconds, and was accompanied by violent action of the muscles attached to the larynx. Vocalization was very imperfect, the sound of utterance being rough and hoarse. Upon inspection after death, (which was caused by suffocation from some particles of food,) a well-defined constriction, forming a complete stricture, was discovered just below the cricoid cartilage, the caliber of this portion not exceeding that of a crow-quill. When opened from behind, the trachea presented the following appearances: superficial cicatrices of a smooth and polished appearance, extending both below and above the stricture, entire absorption of the cartilaginous rings of the trachea, from about half an inch below the thyroid cartilage downwards to the extent of about three inches; constriction of this portion, the inner surface being quite smooth; dilatation of the trachea below, larynx sound.

xv. *Case of tumours in the head and face*, by Mr. ANCELL. The subject of this case was an unmarried female, aged fifty-two. The disease first appeared when she was about fourteen or fifteen years old. The greater part of the scalp and face was loaded with solid tumours, of different sizes. Those on the scalp were externally of a very florid colour, smooth, glassy, and denuded of hair; in shape they varied from a nearly globular to an irregular, flattened spheroidal form, with a tendency to assume a mamillated outline. Interspersed among them were a few perfectly round, and of a violet hue. Some of the tumours were sessile on broad bases; others were suspended by short, thick peduncles. One of these latter was removed, and when divided showed a smooth, shining, semi-transparent texture, of a very pale pinkish hue, and a nearly cartilaginous consistence; it appeared to be homogeneous, excepting that a few vessels ramified through it: the investing skin was much more vascular. Similar tumours were scattered over the face, but they were mixed with tubercles of a different nature. The layer of these had all the characters of lenticular tubercles, depending upon hypertrophy of the dermis, while most of the smaller ones were follicular elevations, such as accompany other cutaneous diseases. The tumours sometimes itched;

they were painful when pinched, but were generally free from uneasiness. At one time a few were extirpated, and subsequently Mr. Bryant removed sixty at one sitting. They had then a different appearance; they did not approach a cartilaginous consistence, and on making a longitudinal incision, the contents were easily turned out. Within twelve months of the operation they were all reproduced.

About five months before she came under Mr. Ancell's care, the patient, who had enjoyed uninterrupted good health for a series of years, discovered something hard in the abdomen. The tumour was uneven in surface, and was situated in the right hypochondrium. Ascites supervened after a short period, and was followed by anasarca of the lower extremities, and she gradually sank from exhaustion.

After death the following appearances were found in the abdomen. The peritoneum was generally opaque, but with a shining surface. The parietal portion, and the lining of the diaphragm were studded with myriads of tumours, of various sizes. The fat of the great omentum was almost entirely absorbed, and its tissue was sprinkled over with numberless granules : some larger masses being interspersed, many of which were merely suspended by afferent and efferent blood-vessels, with a few shreds of cellular tissue. A very large mass, weighing about two pounds, was suspended from the anterior edge of the liver ; it extended beneath the right lobe, displacing and pressing the gall-bladder downwards into Glisson's capsule. It was of an irregular ovoid form, with a nodulated surface, and a very firm texture. When divided, the tints of the cut surfaces were extremely varied, green and greenish-yellow predominating. In the centre it was nearly white, and almost cartilaginous ; and there were distinct fibrous radii of irregular dimensions, proceeding from the centre towards the circumference. The remainder of its substance was made up of lobules, with an indistinctly cystiform aspect. Blood oozed on pressure from a good many red points, but the tumour could not be called highly vascular.

The disease appears to have been hereditary, but was confined to the females of the family, who where also remarkably prolific.

xvi. *Case of malformation of the heart*, by Theophilus Thompson, m.d. The right ventricle was divided into two cavities by an imperfect septum, composed of decussating and hypertrophied columnæ carneæ ; some of which, separating from each other near the base of the ventricle, left an aperture of communication about one inch long, and half an inch broad. The circumference of the pulmonary artery exceeded that of the aorta by nearly an inch, and it had four perfect valves of equal size, a very rare, if not unique deviation from the natural structure.

xvii. *Case of petechial cowpox*, by Dr. Gregory. An apparently healthy female child was vaccinated from unexceptionable lymph, in five places on the left arm. On the 5th day, the mother observed that the arm was more inflamed in this child than in two others of her children who had been vaccinated at the same time, and from the same matter, and she also noticed some spots on the face. On the ninth day, when Dr. Gregory first saw the child, the outer portions of a large areolous circle had assumed a yellowish tint, while the inner portions were still of

a dark mahogany colour. The vesicles themselves were jet black. There were numerous petechiæ over the body. On the left temple there was a very large extravasation of blood, owing to a slight bruise. There had been some bleeding from the left ear, and a few drops of blood had escaped from the nostril, but none was discharged by stool. The ecchymosed state of the arm and the petechiæ declined with the cowpox, and on the sixteenth day all hemorrhagic appearances had ceased. During the whole time the child was in perfect health.

XVIII. *On the ulceration of the duodenum after burns,* by Mr. CURLING. This is a very interesting paper, showing that in cases of severe burns, which are apparently advancing favorably towards recovery, a fatal result is often rapidly induced by acute ulceration of the duodenum, especially of that portion which passes round the head of the pancreas. Mr. Curling believes the glands of Brunner to be the seat of disease, the obstructed functions of the skin exciting them to undue action. Should such a state of things be suspected during life, he recommends the application of leeches to the corresponding part of the abdomen, the exhibition of hydrarg. c. creta with opium, and a very mild fluid diet.

XIX. *Cases of malformation of the heart,* by Dr. T. B. E. FLETCHER. These cases are interesting but to the morbid anatomist. Our limited space prevents our noticing them at large.

XX. *On tumours in the neck,* by B. PHILLIPS. The design of this communication is to show that there is a class of uni-or multi-locular encysted tumours in the neck, which contain a serous fluid, varying from a light yellow to a deep-coffee colour, and which are generally developed quite independently of the thyroid body, though in their course they may become intimately connected with it. They are generally developed at or after the middle period of life, are almost always of slow growth, and often attain a large size. Puncture and seton appear the best method of treatment. The cases are instructive and deserve attention.

On a variety of False Aneurism. By ROBERT LISTON, F.R.S., Surgeon to University College Hospital, Professor of Clinical Surgery in University College, &c. &c. (Read to the Royal Medical and Chirurgical Society, March 8th, 1842. Printed at the author's expense for distribution among the members.) 8vo, pp. 39.

Why this paper has been " printed at the author's expense, for distribution among the members" of the Royal Medical and Chirurgical Society, and not published in the Transactions of that body, we are at a loss to discover, and probably the Controlling Council might feel some little difficulty in returning a plain answer to the question. To our thinking, no narration more instructive to the practical surgeon, or interesting to the pathologist, has graced their pages for some years past ; and so far as our readers are concerned, we take leave to remedy the omission in the aforesaid Transactions, by laying before them the leading points of the unjustly-slighted memoir.

In a puny boy aged nine,* a small swelling began to form immediately below the right ear, about two months before his admission into the North

* The age has been since stated to be 12.

London Hospital.   It was fomented and poulticed, and increased gradu-
ally.   Within three or four days of his admission its progress became
more rapid and its shape irregular.   He presented himself October 20th,

—"Having a tumour at the angle of the jaw on the right side, extending back-
wards as far as the posterior border of the sterno-mastoid muscle, (the upper
part of which was pushed forwards,) downwards to within an inch of the clavicle,
and forwards to about half the length of the horizontal ramus of the lower jaw.
It projected into the mouth between the arches of the palate, impeding in a
great degree both respiration and deglutition.   Its most prominent point was
posteriorly and superiorly at the outer border of the sterno-mastoid.   Indistinct
fluctuation could be felt, and there was slight pulsation in it immediately over
the carotid artery; but on grasping the sides of the tumour no pulsation could
be discovered, nor could any be felt inside the mouth.   Mr. Liston made a small
puncture into the tumour under the impression that it contained matter; a gush
of arterial blood followed the operation, and about four ounces were lost in a
few seconds; the wound was closed by hare-lip pins and the twisted suture,
and the bleeding thus checked.   Mr. Liston determined to tie the carotid on the
following day." (p. 5.)
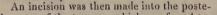
Next day the carotid was tied, after a deep and difficult dissection,
immediately above its origin from the innominata.   The swelling de-
creased, and the case seemed to be advancing favorably.   On the thir-
teenth day, however, bleeding occurred from the point of arterial deli-
gation; and, by repetition, carried off the patient on the evening of the
fifteenth day after the operation.

The account of the inspection after death we give almost entire :

"A small quantity of blood was found to be extravasated in the superficial
cellular tissue around the puncture.   The superficial fascia was now raised, and
the sterno-mastoid, together with the other muscles of the neck, were dissected
down.   The incision which was made in placing the ligature on the artery was
found to have divided the sterno-hyoid and thyroid muscles, as well as part of the
sterno-mastoid.   The tissues around it were consolidated by effused lymph.
The parotid gland appeared to extend lower down into the neck than usual, and
along the anterior edge of the sterno-mastoid muscle were situated three lym-
phatic glands, each enlarged to about the size of a small walnut; the lower one
extended to within a quarter of an inch of the superior extremity of the incision.
These, with several smaller glands, almost entirely filled up the superior part
of the triangle, the trachea being somewhat to the left side, and the sterno-mas-
toid muscle to the right; the carotid artery in this situation was seen uncovered
by the glands.   The external jugular vein was found to cross the mastoid mus-
cle in the ordinary situation, being about half an inch internal to the puncture,
which was through the posterior fibres of the muscle.   Just opposite to the
angle of the jaw lay another enlarged lymphatic gland, somewhat larger than
any that have been mentioned, and extending partly under the sterno-mastoid
muscle.   The whole of these parts were firmly matted together by a dense
deposit of lymph. The clavicle was now cut through at about its external third,
and the upper portion of the sternum was removed.   The sterno-mastoid was
then dissected upwards, but was found to be firmly adherent, at the point of
puncture, to the tissue beneath.   A portion was therefore left at this part, and
the remainder of the muscle, into the substance of which a considerable quantity
of blood had been effused, was removed.   The enlarged glands, the sterno-
hyoid and thyroid muscles, together with the deep fascia, were then removed,
and the innominata, carotid, and sub-clavian arteries exposed.   The ligature
was found to have been placed close to the origin of the carotid from the inno-
minata; it was not completely separated, a small portion of the external side of
the artery still remaining entire.   The proximal end of the vessel was quite
open, and admitted a large-sized probe; there had been no attempt at the
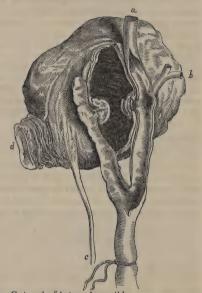
formation of a clot, or, if any had been formed, it must have been expelled with
the blood. The distal end of the vessel was
sealed by a firm coagulum, and around the
situation of the ligature was a considerable
deposit of firm lymph. The arteries arose
from the arch in the usual manner. The
dissection in the superior part of the neck
was now proceeded with. The parotid and
sub-maxillary glands, &c., and the side of the
lower jaw having been removed, a large
tumour was brought into view, extending
from the side of the trachea and pharynx,
outwards as far as, or a little beyond, the ex-
ternal border of the sterno-mastoid; upwards
to the base of the skull, and downwards to
about an inch below the bifurcation of the
carotid; behind, it was limited by the spine
and its muscles. Over the anterior surface
of the tumour could be traced the carotid
artery, free to within three quarters of an inch
of its point of division, where it became
firmly connected with the swelling. Both the
external and internal carotid were connected
to the tumour for about an inch from their
division: the internal, however, was the more
intimately attached. The internal jugular vein
passed over the anterior aspect of the tumour,
but the vagus nerve was found to issue from
behind. Both the internal and external
carotid were now cut through, the former at
its entrance into the bony canal in the tem-
poral bone, and the tumour was dissected
from its situation, turned downwards, and,
together with the heart and arteries, removed
from the body.

An incision was then made into the poste-
rior part of the tumour, which was found to contain a quantity of dark grumous
blood, external to which was a thin layer of organized lymph which entirely
lined the parietes of the cyst. A probe was passed down the internal carotid
artery, and found to enter the cyst just opposite the division of the common
carotid; this point was, however, obstructed, a mass of coagulable lymph
almost entirely blocking up the entrance. The parietes of the tumour behind,
were about a line or more in thickness, but on the outer side, on the aspect
adjacent to the puncture, they were much thinner. They appeared to be com-
posed of three layers differing in character, but organically connected together.
The outermost layer consisted of condensed cellular tissue having portions of
the surrounding structures attached to or imbedded in it. The middle layer,
which was not so evident on the outer side of the tumour, was very dense and
opaque, so that it appeared like a distinct white line on a section of the parietes
of the tumour. The innermost layer was soft and pulpy, semi-transparent, and
of a pale dirty red colour; its inner aspect, forming the inner surface of the
cyst, was smooth, and for the most part even; but in some points, and especially
at the posterior part of the cyst, it presented a fasciculated appearance like the
interior of the auricles of the heart, or of a fasciculated bladder, only not so well
marked; it consisted, as I have said, of a flaky lymph-like substance through-
out. Opposite the outer part of the tumour (where its parietes were thinnest)
this substance was flocculent and broken, and contained patches of a bright yel-
low colour; here it was not distinctly laminated, and it adhered rather firmly

to the middle layer of the cyst, but in other situations it was easily separable into laminæ, and was not so firmly adherent. The cavity of the cyst contained a quantity of grumous blood. The common carotid and the internal and external carotid were firmly attached to the front of the tumour. The opening by which the cyst had communicated with the artery had been about three lines wide and two and a half lines long, and was situated at the bifurcation of the common carotid. It was now completely closed by a firm clot, in which no

perforation was visible, so that the probe which had been passed down the internal carotid into the cavity, must have been forced either on one side of this clot or through it. On the side next the vessel, the surface of the clot was concave, broken in the centre, but smooth towards the circumference, where it was closely adherent to the margin of the opening in the carotid artery. The opposite side of the clot was convex, and projected into the cavity of the cyst. On making a vertical section through the artery, the walls of the tumour, and the clot, the latter was seen to be composed of fibrinous laminæ. The edges of the opening in the vessel were found to be well defined and slightly everted; the external coat of the artery was distinctly traced, and afterwards dissected from the middle coat quite up to the margin of the opening, where it terminated abruptly, not being reflected on to the outer surface of the tumour. The coats of the vessel showed not the slightest dilatation at the part where it was connected with the tumour." (pp. 8-14.)

a. Cut end of internal carotid.
b. Opening in the vessel; the three coats dissected to its edge.
c. Pneumogastric nerve.
d. Opening through the integument, muscle, and cyst.

It seems to us very plain that the foregoing case was of the exact nature which has been assigned to it by Mr. Liston. A chronic abscess gradually formed among the lymphatic glands in the upper angle of the neck of a boy, probably of a scrofulous habit original or acquired. That abscess had its original site in the immediate vicinity of the large vessels. As it slowly advanced they were displaced and compressed. For about two months the arterial coats, where most pressed upon, resisted the incitement to ulceration, by virtue of the inherent vital power with which they are so wisely endowed to that effect. But at last they gave way. The cavity of the abscess and the canal of the ulcerated artery now became continuous; and what had been, up to the period of arterial ulceration, the cyst of a chronic abscess, now became the sac of a false aneurism. This change took place three or four days previously to the boy's admission into the hospital; and was followed, as can readily be understood, by marked and sudden increase of the tumour. The true nature of the case, however, was not suspected. On examination all the characters of chronic abscess, latterly supposed to have sustained the supervention of

an acute action, were apparent; those of an aneurismal complexion seemed but an ordinary simulation of that more grave disorder. An exploratory puncture disclosed the error of diagnosis. The disaster was instantly met, however, and that suitably. The only available treatment was put in force, and who dare honestly lay the blame of its unsuccessful issue on the surgeon?

That such was the actual train of events, a careful and impartial consideration of the case has fully convinced us. But we know that others think differently. And in the class of these " others," it is probable that a majority of the council of the Royal Medical and Chirurgical Society are to be found.

" It was ordinary aneurism," say some. We dissent, for the following reasons:

1. The patient's age is one at which spontaneous aneurism is very unlikely to occur. Take the latest authority on this point. " Seeing then that aneurism is at least negatively subject to certain laws, that it is not met with in animals, *that it is not met with in the human subject before the age of puberty,*" &c. (Porter on Aneurism, p. 37.)

2. The opening in the vessel is small, and has all the appearance of recent formation by ulceration; its edges are ragged, abrupt, and well-defined; all the arterial coats stop at this aperture, and the cellular is not found spreading over the cyst; in other respects, likewise, the parietes of the cavity present the usual characters of the cyst of a chronic abscess in such a situation, thinning as usual towards the surface, and not those of an original aneurism, whether false or true; the inner aspect, " consisting of a flakey lymph-like substance throughout," looks like a pyogenic membrane, and does not at all resemble densely compacted fibrin of a laminated arrangement; there is no steatomatous or other degeneration of the arterial coats at the ulcerated point; no dilatation there. In brief, we find not one sign of spontaneous aneurism, in any of its known forms.

3. Had the tumour been originally an aneurism, the sudden accession to its growth, when it became rapidly enlarged, and of an irregular form, a few days before admission, could have proceeded but from one cause, viz., the diffuse form having supervened on the circumscribed. But that no such occurrence could have taken place is proved by the cyst being found continuous in its walls, which had at no point given way, but were merely thinning outwardly, as all cysts of abscesses are in the habit of doing, and by the absence of sanguineous infiltration in the surrounding tissue. " A small quantity of blood was found to be extravasated in the *superficial* cellular tissue, *around the puncture,*" obviously caused by that puncture, and that was all.

But, say the upholders of aneurism, when driven from their pathological ground, " How do you reconcile an early *symptom,* which we have been assured existed in this case, with your ideas of its nature? It was at first a small tumour, compressible and capable of being made to disappear entirely by pressure." An abscess may be so, as well as an aneurism; all " compressible" tumours are not necessarily aneurismal. This very day, we have ourselves handled two abscesses of this character: one in the axilla, the other in the groin; both occurring in cachectic strumous subjects; one acute, the other chronic; both surrounded by

considerable induration, within which the fluctuating tumour receded upon pressure, and seemed to disappear. One we opened without mishap ; the other is reserved for a future opportunity, in deference to the wishes of the patient.

A more negative position has been taken up, and it has been asked, " If it was an abscess, what became of the pus? why did not the matter show itself by gushing forth from the incision?" Courteous disputant ! Did you ever open an abscess through some thickness of parts and find a difficulty in persuading your patient that the result within the recipient vessel was not " all blood, and no matter?" Have not the common occurrences of surgical practice long since convinced you, that it requires no great amount of blood by commixture to disguise and conceal no inconsiderable quantity of purulent fluid? Can you not readily imagine how a few ounces of thin pus (it was a chronic abscess in a strumous child,) must have quickly disappeared in the whirling eddy of a pool by the side of the big carotid? And are you not now satisfied that, supposing the case to have been as Mr. Liston states it was, it would have been indeed remarkable, and almost inexplicable, had a fluid presenting any of the distinctive characters of pus, followed the withdrawal of the bistoury?

Shifting again, it is asked, " How could so much matter be suddenly thrown into the general circulation, without entailing the most disastrous consequences?" We reply, the pus-globules were few in number; the fluid was in its major part serous. And there is no proof of their *sudden* commixture with the general stream ; they may have been added so gradually (for the arterial opening was a small one,) as not necessarily to create aggravated constitutional irritation, or formation of purulent deposits within internal organs.

" Could the artery have been opened by the plunge of the bistoury?" Certainly not.   A mere glance at the relative position of the parts declares this idea extravagant, and the supposed fact impossible.

It is perhaps asked, why the artery was tied so near to the anonyma, at a point so palpably unfavorable to obliteration? There was plainly no choice ; for the tumour had encroached so far on the lower part of the neck, as to render any more eligible site for deligation impracticable.

Do we wish for corroboration of our views in this case? we are not without supporters. M. Robert, a distinguished surgeon of France, in his treatise "Des Anévrysmes de la région sus-claviculaire," (Paris, 1841,) p. 81, observes " M. Liston, qui exerce avec éclat la chirurgie à Londres, a été accusé d'avoir ouvert un anévrisme de l'artère carotide·qu'il aurait pris pour un abcès; mais les détails récents publiés par ce praticien établissent qu'il s'agissait bien dans ce cas, comme dans le précédent, d'un véritable abcès développé autour de l'artère carotide, dont les parois avaient été ramollies et érodées."

Some of the best surgical authorities of this country, whose opinions we have had opportunities of hearing, agree in the judgment of M. Robert. Among these we may name Sir Philip Crampton, as having no doubt whatever of the accuracy of Mr. Liston's view of the case.   Sir Philip has given us the particulars of a very analogous case which occurred to himself many years ago.   The cavity of a venereal bubo was similarly converted into a false aneurism, by communication with the ulcerated femoral artery.   He had to tie the external iliac, and we are not sure but it was

the first case in which that vessel had been deligated on that side of St.
George's channel.   The man was under treatment for syphilis in the
Lock Hospital, and had an open bubo.   Sir Philip was called to him in
consequence of his having suddenly lost a large quantity of blood from
the opening (which was small) in the abscess at the groin.   The bleeding
had ceased, but a large and obscurely pulsating tumour, double the size
of the original abscess, had formed in its place.   The external iliac, as
already observed, was tied, with fair prospect of success; but secondary
bleeding came on about the usual time, and had the usual termination—
death.

We hold then, on these grounds, the conduct of Mr. Liston, in con-
nexion with the case in question, to have been in no way reprehensible.
On the contrary, the profession is much indebted to him for his candid
narrative, and for the valuable instruction which it is made to bear.   We
see that even the most experienced, skilful, and dexterous surgeon may be
deceived in diagnosis, and so be led into serious practical error.   We are
more than ever persuaded of the claim and necessity for all care and pre-
caution in the examination of tumours, ere their character is definitely
determined and their active treatment thereupon commenced : we are
more than ever strengthened in the salutary dread of leaving an increasing
abscess, whether chronic or acute, in continued juxtaposition with impor-
tant vascular tissue : and we have been introduced to, and made ac-
quainted with, a new form or variety of false aneurism, of the greatest
pathological interest, and of the highest practical importance.

Other cases are quoted by Mr. Liston illustrative of how the aneu-
rismal accession is made to the abscess, from the experience of Professor
Syme, Dr. Craigie, Professor Fergusson, Sir James Macgregor, M. Breschet,
Mr. Quain, &c. But these, and the object to which they tend, admitting
of new dispute, we need not enter on their details. Suffice it to say, that
they are all most interesting as well as apposite and conclusive.

The eminent author of this paper, we are well aware, requires no
extrinsic aid to succour his professional fame and reputation.   We have
made the foregoing observations with no such object in view, but simply
in justice to ourselves as impartial journalists, and in fulfilment of a
solemn duty we owe our readers in all such matters, to " nothing exte-
nuate, nor set down aught in malice."

Art. XIV.

On Injuries of the Head affecting the Brain.   By G. J. GUTHRIE, F.R.S.
&c. &c.—*London*, 1842.   4to, pp. 155.

WE should but trifle with our readers, and employ our space most un-
profitably were we to insist on the great practical importance of those
affections which constitute the subject of Mr. Guthrie's treatise.   We
shall, on this point, content ourselves with quoting and adopting our
author's opening sentence : " Injuries of the head affecting the brain are
difficult of distinction, doubtful in their character, treacherous in their
course, and for the most part fatal in their result."   A commentary on
such a theme written by a surgeon of experience and reputation cannot
fail to attract the attention of the profession, and demands on our part a

candid and careful examination, a duty which we shall best discharge by giving an analysis of Mr. Guthrie's treatise, accompanied by such remarks as, in our opinion, may seem called for. The reader can then judge for himself whether Mr. Guthrie has removed any of the difficulties, or cleared up any of the doubts, that so often occur to even the most consummate practitioner in the treatment of injuries of the head.

In the first few pages of the work Mr. Guthrie discusses the question of localization of disease or injuries of the brain; whether, for example, we can determine from the symptoms what part of the brain may suffer from compression, or be occupied by an abcess; and the same question is again considered at greater length when treating of compression of the brain. The physiological and pathological researches of Flourens, Mayo, Magendie, Bouillaud, Marshall Hall, &c. are given in brief yet sufficient detail so far as they bear on this subject, respecting which Mr. Guthrie coincides in opinion with every practitioner of sufficient experience, acknowledging that, "such are the deficiencies in our knowledge of the complicated functions of the brain, that although we think we can occasionally point out where the derangement of structure will be found, which has given rise to a particular symptom during life, the very next case may possibly show an apparently sound structure with the same derangement of function." In fact, if we attempt to base our diagnosis on the symptom of paralysis for example, how much more do we know than was ascertained by Hippocrates, who announced that the cause of mischief occupied the side of the brain opposite to the paralysed limb. The progress of science has merely taught us that the rule though general is not universal, as in some few cases the paralysis and the lesion of the brain exist on the same side : Mr. Guthrie states (p. 45) that Burdach has collected fifteen cases in which this occurred. We think, however, that M. Rochoux has shown that several of these cases are far from being conclusive, but it must be admitted that seven or eight of them establish the point beyond doubt, and Mr. Guthrie himself records a case (p. 26) in which, to use his own words, there was "rupture of the roof of the ventricle of the *right* or the *same* side of the body as that which was affected" with paralysis ; though he does not allude to this remarkable case in connexion with this particular point. Foville and Pinel Grandchamp, as our readers must be aware, consider that paralysis of the upper extremity indicates a lesion of the opposite optic thalamus, and that paralysis of the lower extremity is caused by an affection of the corpus striatum ; but the uncertainty of these signs has been repeatedly demonstrated, and the facts appealed to in their support are, as Mr. Guthrie says, "merely coincidences when they occur." Attempts have also been made to connect certain disturbances of the intellectual faculties with injury of certain specific parts of the brain. Into this question we need not enter ; abundant information on the subject exists in the former volumes of this journal : suffice it to say that experience has fully demonstrated the fallaciousness of these speculations. Mr. Guthrie, however, very properly attaches much importance to Dr. Marshall Hall's views respecting the nervous system, and conceives that they may enable us, to a certain extent, to conclude "as far as is possible what great division of the brain is most seriously injured, and more particularly with respect to the prognosis than the treatment." Thus, for example, "the loss of mobility of the iris

implies an affection of the tubercula quadrigemina. Convulsions, vomiting, a drawing up of the limb not affected by paralysis, stertor, a difficulty in swallowing, strabismus, and relaxed sphincters, show derangement of the spinal functions; which is well marked when tickling the eyelashes causes no closing of the lid, the verge of the anus no contraction of the sphincter, the sole of the foot no motion of the toes." (p. 6.)

CONCUSSION. After these preliminary considerations Mr. Guthrie proceeds to treat of concussion of the brain; the mechanism of this injury, and the character of the anatomical lesions it produces, if any, have given rise to much discussion; the former of these questions he passes by in silence, the latter he considers at some length. " By the term concussion of the brain," we are told, " a certain undefinable something, or cause of evil which cannot be demonstrated, is understood to have taken place." (p. 7.) In one sense this may be perhaps true, in another it certainly is not; we can demonstrate what the *cause* of the evil is: whether any structural alteration, any anatomical lesion of the brain, has ever been recognized as an effect of that cause is another question.

With regard to the first point a reference to the mere elements of physics *demonstrates* what it is that *must* occur in concussion of the brain. The brain is a pulpy organ which exactly fills a nearly spherical bony cavity, whose parietes are elastic in a considerable though very variable degree; and if these parietes sustain any sudden change of shape, their contents must sustain a corresponding amount of compression. As any alteration in the shape of a spherical cavity must lessen its capacity, whenever any external force impinges on the cranium with sufficient violence, it must be flattened at the point of impact and expanded in some opposite direction; but these changes are, in virtue of the very cause whence they originate, of but momentary duration; the point primarily flattened by the compressing force immediately resumes its original shape, which is necessarily followed by a corresponding return of the expanded portion of the cranium to its previous dimensions. These oscillations may occur several times in rapid succession, their number and extent depending on the elasticity of the cranium, and on the amount and direction of the force applied. In concussion then the entire brain sustains a series of vibrations and momentary compressions, varying in number and amount in every imaginable degree in different cases. If this explanation, which we imagined was now universally admitted, required any extraneous proof, we might appeal to the fact that when fracture of the cranium takes place, the force of the shock is frequently expended on the bone, and concussion occurs either not at all or in but a slight degree. We cannot but consider this explanation as better calculated to give us a rational view of the nature of concussion than is the following illustration offered by Mr. Guthrie: " The term concussion is very aptly and forcibly illustrated by the homely but striking expression in use in our sister country, when a man has been suddenly killed by a fall on the head, ' That the life has been shook out of him.' " (p. 7.)

Mr. Guthrie does not allude to the experiments of M. Gama respecting this point, though he refers to his work on other occasions. M. Gama, with a view to determine the direction of the vibrations caused in the brain by concussion, arranged several pieces of thread in a glass matrass filled with a solution of isinglass of nearly the consistence of the brain.

Moderate percussion on the circumference of the globe always produced
a visible effect at the point struck, and vibrations were propagated to a
short distance ; a stronger blow caused a momentary separation of the
gelatinous mass from the glass, a similar effect being at the same time
produced at the diametrically opposite point, and it then resumed its ori-
ginal position.   This double impulsion of necessity propagated the shock
to the centre of the gelatine in two opposite directions, from whence, ac-
cording to the laws of impulsion, it was returned to the circumference ;
the threads which had yielded to these two impulses, that is to say, which
were carried inwards from each side, subsequently vibrated in a contrary
sense, and then underwent some irregular motions.   If the matrass be
held with the neck down, and the extremity of the neck be struck, the
threads vibrate from within outwards (the reverse of what occurs in the
former case), and the gelatine is not detached at the point of the globe
opposite the insertion of the neck.   The vibrations, however forcible the
blow may be, are always expanded from the centre towards the circum-
ference ; as a secondary effect, indeed, the vibrating motion is returned
towards the centre, but in so faint a degree as to be barely perceptible.

From these experiments M. Gama concludes that if the cranium be
struck at any point, which, as well as the point diametrically opposite to
it, occupies the sphericity of the cranium, the mass of the brain contracts
on itself, either from the point of percussion alone, or from it and the op-
posite side simultaneously : the secondary and contrary vibrations are
subordinate to this primary effect.   But if the vertex be struck the effect
is different, the brain retreats from the cranium at the percussed point
alone, and the base of the cranium sustains a disseminated *contre-coup*,
as it were, because of the extended surface it presents.   In indirect con-
cussion, again, communicated to the base of the cranium by the spinal
column, the motion is distributed from within outwards, and the brain is
not separated from the cranium at any point. (Gama, Traité des Plaies
de Tête, p. 101.)   It must be admitted that the glass matrass and its
contents, and the cranium with the brain, are not circumstanced identi-
cally, but it strictly flows from the laws of physics that the effects of
percussion on each must be the same within some degree of approxima-
tion which we cannot pretend to determine.

But do these contractions and vibrations of the brain leave any visible
sign of their occurrence ?   In the vast majority of cases certainly not.
Whatever change they may effect in the structure of the brain, that
change is most commonly, if not always, inappreciable by our senses.
The substance of the brain may of course be lacerated, a circumstance
which is easily understood; but it has also been supposed that when
concussion occurs in an extreme degree the mass of the brain may be
diminished in volume so as to imperfectly fill the cavity of the cranium.
Mr. Guthrie cites the cases and authorities on which this opinion rests.
The first case is the well-known one recorded by Littre.   The second is
mentioned by Sabatier.   The case of Hœnel, alluded to by Morgagni,
is generally considered as another example of the occurrence ; but
Mr. Guthrie, by referring to the original authority, (Commerc. Literar.
Nor. An. 1741. Hebd. 14,) shows that it does not bear on the point.
Richerand and Delpech are said by some to have recorded cases of the
kind, but, as Mr. Guthrie observes, they only refer generally to the ob-

servations of their predecessors. O'Halloran, of Limerick, says, " I have *sometimes thought* the brain did not completely fill the cavity of the skull." Dupuytren, according to Mr. Guthrie (p. 9), merely " thinks that the brain may have less consistence, more or less disposition to diminish in size, and may be readily torn by the slightest effort." But Dupuytren's testimony is much more positive than would be supposed from the passage we have just quoted from Mr. Guthrie's work. After observing that the brain presents in cases of concussion no trace of contusion, disorganization, &c. he says, " This organ has merely lost its consistence, and the slightest effort suffices to tear it. If after death from apoplexy we open the cranium, not with the hammer, but with the saw, we shall find that the volume of the brain seems to exceed that of the cavity which contains it, or, at least, it retains its natural volume and shape. After concussion, on the contrary, the brain collapses, contracts on itself, (*s'affaisse, revient sur lui-même,*) and tends to occupy less space. The reason of this is, that in concussion it contains less blood, and deprived of action and stimulus it shrinks (*tombe en affaissement.*)" (Leçons Orales, t. ii. pp. 496-7.) From this passage Dupuytren must, we think, be ranked amongst those who bear the most positive testimony to the occurrence of the anatomical lesion in question : Mr. Guthrie, however, regards its occurrence with extreme doubt, and more than doubts its connexion, supposing it to occur, with the phenomena of concussion.

" Chopart," he observes, " believes that Littre's case was much exaggerated ; in which opinion I fully coincide, and place little or no reliance on the statement made by him, and so implicitly admitted since his time. I am not willing to believe that a diminution of the size of the brain, or its subsidence from the inside of the bones of the cranium, is more than an accidental circumstance which may or may not be dependent on the shock which takes place, although it be followed by immediate death. In thus expressing my dissent from a received opinion, I do so solely with the hope of stimulating future investigators to closer inquiry on this point of so much interest." (p. 9.)

It is not easy to determine what Mr. Guthrie's opinion on this subject is. On the one hand he seems to admit that a diminution of the size of the brain may occasionally occur in concussion as an accidental circumstance ; while on the other he seems to place " little or no reliance " on the statements of those who aver that they have seen such diminution. Mr. Guthrie may have excellent reasons for rejecting the testimony of Littre, Sabatier, and Dupuytren, but as he has not specified those reasons we cannot pretend to estimate their value. How it is that concussion of the brain can cause a diminution of the size of the organ, is, we admit, very difficult to be explained, but perhaps we can conceive its occurrence in the following way. We have seen that, during concussion, the mass of the brain contracts on itself, the quantity of fluids circulating in it must therefore be lessened at the moment, and if death ensues on the instant, its bulk may remain permanently diminished.

Mr. Guthrie observes that " It is impossible to calculate upon what the extent and nature of the shock may be, which gives rise to a fatal concussion or rupture of the brain," (pp. 9-10,) and instances two cases in which individuals fell from great heights and sustained no such injury. The considerations we have just entered into enables us, we conceive, to explain such apparent anomalies. The occurrence of concussion does not

depend merely on the shock an individual may be subjected to, but also on the force being applied in such a direction that it shall be propagated directly to the brain, and the more nearly it is propagated in a direction perpendicular to any point on its surface, the greater, cæteris paribus, must be its effect. Mr. Guthrie alludes to the notion " that if the fall be from a sufficient height, the brain will recede from the cranium, and a vacuum be formed which may be of longer or shorter duration," &c., and of course rejects it as a groundless speculation.

The symptoms and treatment of concussion are dwelt on at considerable length, and treated in a manner which leaves little to be wished for, save the minor virtues of a more methodical arrangement, and a clearer and more compact style. It would be perfectly useless to give a formal abstract of this portion of the work, as, however good in itself, it contains of course little that is not familiarly known. We shall, therefore, confine ourselves to such observations as may enable the reader to form an estimate of the manner in which Mr. Guthrie treats his subject.

Concussion of the brain may exist in very different degrees, and the symptoms vary exceedingly, not only in kind, but in intensity; it is, therefore, very convenient as regards the study both of its symptoms and treatment to consider it in its several degrees of intensity. Such distinctions must of necessity be somewhat arbitrary and vague, and Dupuytren has perhaps given us the best example of such imperfect classification of the affection. Mr. Guthrie does not adopt any such division, but describes a well-marked case in which all the symptoms are supposed to exist to a rather aggravated amount, and traces it through all its stages of collapse and reaction, ending either in rapid recovery, or passing into congestion and inflammation.

During the first stage of concussion Mr. Guthrie warns us against introducing "strong drinks" into the mouth, as, if the patient were so far recovered as to make any attempts to swallow " they might possibly enter the larynx and destroy him." (p. 12.) According to Dupuytren and Mr. Tyrrell, " in all cases of coma the act of swallowing can be excited, provided the solid or liquid be placed in contact with the fauces;" but Mr. Guthrie observes that " the first insensibility of concussion, and that which follows coma are different states." Dupuytren, however, does not limit the statement to cases of coma, but expressly makes it with regard to concussion. (Leçons Orales, p. 493.) We do not, however, deny the value of Mr. Guthrie's caution, which we think worthy of being borne in mind, though in the many severe cases of the affection we have witnessed we have never seen any inconvenience of the kind alluded to. We are also warned against causing the patient to incautiously inspire very irritant gases, such as strong ammonia, as being liable to cause subsequent inflammation of the nares and throat, and it might have been added of the larynx and trachea; any serious mischief is not perhaps very likely to result, but in several instances undoubtedly the free inhalation of ammonia or chlorine during insensibility from various causes, has produced dangerous and even fatal inflammation of those organs.

Vomiting is a symptom to which much importance has been attached in concussion. Mr. Guthrie thinks it is most apt to supervene when the symptoms begin to amend, and that " it is one of the earliest and most satisfactory symptoms of returning sensibility." It is curious to contrast

the statements of the most eminent practitioners on such points : Sir A. Cooper, (Lect. by Tyrrell, vol. i. p. 254,) enumerates vomiting amongst the very earliest symptoms of concussion ; but subsequently makes a statement partially coinciding with Mr. Guthrie's : " A fit of vomiting, by forcing the blood through the brain, will sometimes almost immediately restore the functions of the mind and body." (p. 262.) Sir B. Brodie says, " sickness and vomiting for the most part are early symptoms, and seldom continue after the patient has recovered from the first shock of the accident." (Med. Chir. Trans. vol. xiv. p. 239.)

" The pupils," according to Mr. Guthrie, " are for the most part in a medium or contracted state." (p. 13.) In a note he mentions and dissents from Dupuytren's opinion, that the pupils are dilated in concussion and contracted in compression.   Sir A. Cooper rather coincides with Dupuytren : he says " the pupils of the eyes are generally natural ; but if changed, both are a little dilated, or sometimes only one." (Op. cit. p. 254.) Sir B. Brodie's experience leans the other way : " the pupils contract on exposure to light, and are sometimes more contracted than under other circumstances." (Loc. cit. p. 338.)   For our own part we have found Sir B. Brodie's statement most generally consonant with our own observation, but have not unfrequently seen the pupils dilated in concussion.

Augmented pulsation of the carotids has been mentioned by Sir A. Cooper as one of the occasional symptoms of concussion ; Mr. Guthrie gives a case (p. 17,) to show that it is not a more certain sign of concussion than of compression.   We are not aware that any one has considered this as a diagnostic sign between the two affections, and at all events Mr. Guthrie's case *proves* nothing, as there was no post mortem examination, though we admit that the case was almost certainly one of compression of the brain.

Mr. Guthrie examines the question whether any positive distinctive signs exist between compression and concussion, and arrives, we need hardly say, at a negative conclusion.   His statements on this head do not contain anything new, but we transcribe the following passage both as a fair specimen of Mr. Guthrie's manner, and because some valuable practical points are well put.   It is not perhaps superfluous to observe that Mr. Guthrie seems to consider some of the observations we are about to quote as original and peculiar to himself, but this is probably a mere inadvertence :

" The deviations which take place from the usual and ordinary modes of breathing, are supposed to offer distinctive signs of the nature of the injury which has taken place. They are, I fear, equally uncertain signs ; they mark the degree of injury, and perhaps the part injured, rather than anything else. Stertorous breathing has always been considered a sign of extravasation causing compression of the brain. I have, however, seen many cases of slight extravasation with partial loss of power of one half of the body, accompanied by great numbness, without any stertor in breathing ; although I have never seen a well marked case of large extravasation without it, or another peculiarity of breathing which is less thought of, although an equally characteristic and dangerous sign of such mischief having taken place when it is permanent ; I allude to a peculiar whiff or puff from the corner of the mouth, as if the patient were smoking ; and which, when observed among other urgent symptoms, is usually followed by death.   Stertorous breathing, and the whiff or puff at the corner of the mouth are presumed to indicate an injury to the cerebro-spinal axis as well as to the cerebrum ; but whether the injury is direct or indirect is uncertain, although it

is frequently accompanied by extravasation or laceration. When the breathing is oppressed or laboured or heavy, neither extravasation nor lesion to any extent can in general be discovered after death. . . . Nevertheless there can be no doubt that a temporary stertor or puff at the corner of the mouth may exist, as a consequence of too great an abstraction of blood." (pp. 17, 18.)

We might point out several omissions in the history of concussion. Thus coldness of the surface is not enumerated among the symptoms of its early stage, and there is no allusion to the temporary or even permanent partial impairment of the memory or other faculty which sometimes follows it. Pain in the head is not once mentioned, even in the account of the third or inflammatory stage of the affection, and we could have wished that the very insidious way in which inflammation of the brain frequently supervenes had been noticed; the more advanced symptoms of the affection are enumerated, and that imperfectly, and it is added "inflammation of the brain is now *fully* established, and must be subdued." (p. 16.) This we fear will in most cases be much more easily said than done; if the cerebral inflammation be not detected and subdued before it is "*fully* established," the chances of death much outweigh those of recovery.

The observations on the treatment of concussion are judicious, but given in a very disconnected way. We think that sufficient importance is scarcely attached to the use of mercury when concussion is passing into its third or inflammatory state. That Mr. Guthrie is fully aware of its great utility, sufficiently appears from the following passage, but then these few lines contain literally all that is said respecting this important point of practice : " In all these and other more desperate cases, the effect of mercury, provided it had been early and rapidly administered, may yet be decisive. Calomel, combined with another and not less important remedy, opium, ought to be given every two or three hours until the effects of both are fairly induced." (p. 25.) We must also take exception to the statement that opium is in these cases not less important than calomel, and that the patient should be brought fully under its influence; we should certainly regard with apprehension so very liberal an use of opium in those cases, and merely employ it, if at all, with a view to accelerate the action of the mercury on the system.

In the twenty-ninth and following pages, Mr. Guthrie adverts to an important class of cases, which are however of unfrequent occurrence, those in which " mania supervenes on the injury." Mr. Guthrie suspects that this occurs only when the sufferer has an hereditary predisposition to insanity, and rarely unless he has shown some previous symptoms of such derangement, and does not advert to Sir B. Brodie's opinion, " that furious delirium and convulsions occur after an injury of the head under nearly parallel circumstances: the former symptom, like the latter, may be produced by pressure on the brain, not however by such a degree of pressure as threatens completely to annihilate the functions of that organ, but by that smaller degree of pressure which operates merely as a source of irritation." (Op. cit. p. 375.) Mr. Guthrie recommends the use of opium in those cases : " The value of the treatment," he states " is entirely dependent on the substitution of opium and morphia, with a moderately nourishing diet, for bloodletting ; I have not met with an instance in which it was necessary to give wine or other

stimulants, but I can readily conceive that cases requiring them may occur in very irritable persons, or who may have been in the habit of indulging in their use." (p. 32.)   Sir B. Brodie, on the contrary, tells us that "when a patient is affected with furious and roving delirium, blood should immediately be taken from the arm, and if possible in a full stream.   I scarcely remember a single case, in which delirium of this kind, occurring soon after a blow on the head, did not yield to a copious bloodletting." (Loc. cit. p. 422.)   Perhaps Mr. Guthrie may mean to speak of a different class of cases from those referred to by Sir B. Brodie ; but as he simply uses the term " mania," we cannot determine this.   Three cases indeed are given to illustrate the value of the treatment recommended ; but in one no symptom of mania or delirium were present, and in another the patient is described as being " violent," and requiring " the restraint of a tight jacket."   Greater precision in defining the therapeutic indications relative to so important a point of practice would have been highly desirable.

COMPRESSION. The account of compression of the brain is prefaced by some considerations relative to the opinion especially advocated by Munro (Secundus), and Sir C. Bell, that the proper substance of the brain is incompressible.   It must, we take it, be admitted that the molecules of the brain are compressible in but a very slight degree, probably not more so than water is.   Putting the theoretical question aside, however, the following considerations must ever influence the practitioner :

" Considering that we can often see the natural and ordinary size of the brain diminished under pressure, and that certain symptoms, such as insensibility, syncope, convulsions, paralysis, are consequent on this state, and are relieved by the removal of the pressure and the restoration of the compressed brain to its ordinary state, we may safely conclude that some derangement takes place in its integral parts, which may be best understood by the word compression. . . .   When we see a patient lying in a state of insensibility with a fracture of the cranium, immediately recover his senses, after the application of the trephine and the removal of a large coagulum of blood, we are apt to conclude that the coagulum of blood and the insensibility stand in the relation to each other of cause and effect." (p. 40.)

With reference to Sir C. Bell's opinion that compression acts not on the substance of the brain, but only on its blood-vessels, lessening their diameter, and consequently diminishing the quantity of blood circulating in the organ where its functions are interfered with, Mr. Guthrie says, " it is not unreasonable to conclude that the pressure had occasioned the insensibility, and that this did not depend alone upon some few vessels containing less blood than usual."   For our own part we quite agree with Sir B. Brodie, " that, although we admit the substance of the brain to be incapable of being compressed into smaller compass, yet that the effect of all pressure on it must be, and is, to alter the position and relative situation of the delicate fibres of which its minute structure is composed, and that we need seek no further explanation of the symptoms which are met with in these cases." (Loc. cit. p. 334.)

Mr. Guthrie notices the experiments of Serres and Flourens on the influence exerted on the functions of the brain by blood extravasated within the cranium.   Serres trephined a dog over the longitudinal sinus, and transfixed the sinus with a narrow bistoury ; the animal retained its natural liveliness, though on opening the cranium some hours after the

experiment, large coagula of blood were found on the surface of the brain. This experiment was frequently repeated and uniformly with the same result ; no stupor, none of the symptoms of compression were produced. M. Flourens objected to these experiments that blood could only com-press the brain while it was itself compressed by the cranium ; and, by operating on young animals, was enabled to perforate the sinuses of the brain without trephining the skull ; and the hemorrhage thus produced was followed by symptoms of compression, which were immediately re-lieved on removing a portion of the cranium,—an observation which is illustrated by a remark of Mr. Keate, mentioned page 56, but not alluded to by Mr. Guthrie in connexion with these experiments : "Mr. Keate has invariably remarked that the symptoms dependent on extravasation have been less severe in the first instance, in proportion as the separation of the edges of the fracture has been greater one from the other, or when the sutures have yielded to the shock, and been separated." The degree of pressure unquestionably exerts a material influence on the symptoms. Sir A. Cooper states in his Lectures, that having trephined a dog and pressed on the brain with his finger, the animal at first suffered no in-convenience, but on the pressure being gradually augmented, became affected with complete coma ; M. Malgaigne's experiments, (which Mr. Guthrie does not notice,) performed by injecting water into the cranium of rabbits, go to establish the same point, viz., that mere compression unaccompanied with lesion of the brain produces no bad effects, unless it is exerted to a very considerable degree. (Anat. Chir. v. i., p. 315.) But however conclusive such experiments may appear, they do not enable us to clear up the difficulties that occur in practice, as Sir B. Brodie has observed : "It is difficult to explain wherefore the symptoms to which it (compression) gives rise are sometimes slight, and at other times urgent, although occurring under circumstances apparently similar. A depres-sion of bone, which in one instance produces comparatively little effect, in another case occasions a manifest destruction of sensibility, and the same observation may be made respecting extravasated blood. Every practical surgeon must have observed that there are differences in the symptoms produced, which are not to be accounted for by any differences in the quantity of pressure, nor in the particular part of the brain which is affected by it." (Loc. cit. p. 344.) Serres, Gama, and other French surgeons seek to escape from the difficulty by saying that the symptoms commonly attributed to compression, are rather produced by irritation of the brain ; but this explanation does not seem very satisfactory.

The account of the symptoms of compression of the brain is given at great length, and we may add with great judgment and truth, evidencing extensive, and what is much better, accurate observation. We shall make no apology for presenting the following rather lengthy extracts to our readers, which we select as specimens of Mr. Guthrie's minuteness and fidelity of detail. The observations on convulsions also contain some interesting and valuable practical remarks, which further induces us to extract them :

"Paralysis of one side of the face and hemiplegia are common ; paraplegia is more rare. In both kinds of palsy, one part in one limb may be more com-pletely affected than another, in which convulsive twitchings are sometimes present, as well as a frequent drawing up of the limb of the unaffected side.

Tickling the soles of the feet or the palms of the hands will sometimes cause retraction of the toes or fingers, when the limbs are apparently motionless; pricking them gently with a pin will often give rise to convulsive startings and tremblings of all the muscles of the extremity when tickling fails, showing that the capability to move the part remains, although the will to do so is wanting. The leg or arm is sometimes drawn towards the body when separated from it; it more often falls from the hand as if it belonged to the body of a dead person; the muscles are occasionally more stiff and rigid, and some power of motion remains, although little of sensation; sometimes sensation is perfect when motion is lost, and sensation may be lost on one side, and motion on the other." (p. 43.)

" Convulsive actions of the muscles or positive convulsive fits, are always important symptoms; yet they seem in some persons to be dependent on idiosyncrasy, particularly when they appear early and after the loss of blood, in which cases they are less dangerous. They occur at different periods after the receipt of the injury, and have been supposed to depend in general upon laceration of the substance of the brain, although experiments on animals would seem to show that they may be caused by irritation of the cerebro-spinal axis within the skull, when the patients are more likely to recover. They have been observed to accompany these injuries from the earliest antiquity, and to appear particularly on the side opposite to that which is paralytic, so as to give rise to the idea that paralysis was dependent on injury of one side of the cerebrum, and convulsions of the other. When the effect of the injury is so great as to prevent the transmission of sensibility along the nerves to the muscles, the paralysis is complete, and, I suspect, convulsive twitches do not then take place, although they frequently precede and may in many cases be considered as premonitory signs, whilst the evil which gives rise to the paralysis is gradually accumulating. When the paralysis is not complete, I have frequently seen that side affected by slight convulsive twitches, whilst the other suffered from well marked spasms; leading to the belief, that whilst paralysis is an affection of only one half of the brain of the opposite side, or of half of the spinal marrow of the same side, convulsions are the effect of a more general irritation, capable however of being confined to a part; for partial convulsive motions do very frequently occur without any paralysis accompanying them on the opposite side, and I have not seen these convulsive actions occur, as far as I can recollect, where both sides have been paralytic from injury of the head, although spasms and twitches are symptoms of daily occurrence in paraplegia from disease of the spine. I have met with several cases in which the convulsions have ceased, and the patients recovered after the removal of a portion of bone which was irritating the brain, but convulsions have generally been the forerunners of death when the seat of injury was unknown, and this assistance could not be given. . . . Convulsions, it must be remarked, are among the most common symptoms of inflammation of the membranes of the brain, although they are frequently wanting. They may be expected to take place about and after the fifth day in injuries of the head, when inflammation of the brain is about to extend to or become continuous with the neighbouring parts, and may be more or less severe, varying from a state of partial trembling of a limb, to that of general agitation and restlessness of the body generally; from a slight irregular movement of the eyelids or muscles of the face, to the more marked spasmodic startings of the whole of one side, grinding of the teeth, and contraction of the limbs. Sir B. Brodie has well shown that they may exist at a late period independently of inflammation, ' being aggravated by any additional abstraction of blood, and subsiding on the patient being allowed to take some more substantial nourishment than that which had been allowed him previously.' They would seem in these cases to be dependent on the same or similar causes to those which gave rise to them after the loss of too great a quantity of blood in the first instance, and to be relieved or removed in a similar manner. It is far different with those convulsive movements which, at a late period, become nearly permanent or rigid spasms,

resembling tetanus, in which the body is drawn in different directions forwards, backwards, or to one side. They are for the most part the forerunners of death; fortunately they are seldom present except in very hot weather, and are not even then of very frequent occurrence. Examination after death in such cases has shown nothing discoverable beyond inflammation of the pia mater, and an effusion of fluid, generally purulent, on the surface of the brain or in its ventricles, or between the pia mater and tunica arachnoides." (p. 50.)

When a patient retains his consciousness and faculties unimpaired after receiving injury of the head, but after the lapse of a short period becomes heavy, drowsy, stupid, unwilling to move, and gradually gets insensible, it is usually considered that extravasation of blood has taken place; a short interval of consciousness between the receipt of the injury and the supervention of the symptoms of compression, as a certain, though doubtless rather rare, distinctive sign between concussion and compression, and conclusive as to the occurrence of the latter affection. Mr. Guthrie twice states (pp. 23, 56,) that under such circumstances, " extravasation has not always taken place," and the symptoms of compression may arise from mere congestion.

"If," he says, " the loss of a moderate quantity of blood should relieve such a person, it shows that congestion had occurred, perhaps on the surface of the brain, under the injured spot; recovering from which by the unassisted efforts of nature, he would still be liable to inflammation. I have repeatedly seen a small bleeding from an incision made to allow a complete examination of the part in such a case, cause the restoration of the patient to his natural state. A return of untoward symptoms during the progress of the case does not always indicate essential mischief, and will be removed, if of a temporary nature, by a further moderate bleeding, by purgatives, &c.......If the loss of blood should not relieve the symptoms, the case is probably complicated by an extravasation having taken place between the dura mater and the bone, and even in, or on the surface of the brain." (pp. 56-8.)

Four cases are given in support of this opinion, (pp. 23-4, 57,) in which the patients recovered under the circumstances in question, after bloodletting. A case is also quoted from Le Dran (16th Observation, p. 57, note,) exactly parallel to those mentioned by Mr. Guthrie, save that the patient ultimately died; and on dissection there " were found several small spots of coagulated blood in different parts of the brain, one of which was as large as a nut." We think that this case, quoted by Mr. Guthrie himself, should have induced him to modify his opinions on this point. We cannot pretend to say that the supervention of symptoms of compression following an injury of the head after so short an interval of consciousness that inflammation has not had time to set in, may not occasionally depend on congestion, but, we ask, where is the proof? The test mentioned by Mr. Guthrie, the recovery of consciousness after the loss of blood, is evidently fallacious. In Le Dran's case this did occur, and yet dissection proved that extravasation of blood had taken place. Moreover, the insensibility produced by actual compression on the brain, does not by any means always remain constant in amount. To again avail ourselves of the words of Sir B. Brodie, (loc. cit. p. 346,) " at one time it may be perfect, then the patient may show some signs of consciousness, and then relapse into a state of stupor. It may be observed that there is especially an increase of insensibility after bloodletting." The cases cited then by Mr. Guthrie may have been, and,

looking to Le Dran's case, probably were, cases of extravasation of blood to a small extent, in which bloodletting relieved the symptoms to a greater extent than it usually does, and at the same time arrested the hemorrhage, so that the amendment was permanent.

With reference to fracture, accompanied with rupture of the middle meningeal artery or its branches, five cases are given (pp. 59-61), in each of which there was an interval of sense between the injury and the occurrence of symptoms of compression; four of the patients recovered; in each of them the brain was depressed, but recovered its natural level when the compressing cause (the coagulum of blood) was removed; in the fifth case the brain did not regain its level, and the man died. The same circumstance, followed by a like fatal result, occurred, we may observe, in Mr. Abernethy's 12th case. (Surgical Works, vol. ii. p. 36.) Mr. Guthrie, we presume, has observed several cases of the same kind, as he says (p. 59), " I never saw the symptoms mitigated, or the persons in any way relieved, when the brain remained depressed after the blood had been removed;" and we suppose so general a statement would hardly be made from the experience of a single case. It is perhaps superfluous to say, that Mr. Guthrie recommends, whenever symptoms of compression follow a wound over the track of the middle meningeal artery, that " the bone should be immediately examined; and if there should be no obvious fracture, and relief cannot be obtained by the abstraction of blood, the trephine must be resorted to as a last resource; for if there be truth in the statements so confidently made of fracture of the inner table of the bone from concussion of the outer without fracture, it is here especially that we may be permitted to look for it." (p. 58.) And again : " The rule in surgery, to remove the bone in such cases, appears to me to be absolute." (p. 61.) It would appear, from the first of these passages, that Mr. Guthrie is somewhat doubtful about the possibility of the middle meningeal artery being ruptured, without the skull being either fractured or depressed. He does not, on this point, allude to the two remarkable cases quoted by Mr. Abernethy from Mr. Hill and Mr. Latta, in which this actually occurred, though he subsequently mentions Mr. Hill's case, as being " the most remarkable for its severity, and for the recovery of the patient," with which he is acquainted.

The possibility of the occurrence of fracture of the cranium by *contre-coup*, has given rise to much discussion. Mr. Guthrie gives a review of the best-attested cases in which it has been observed, or supposed to have been observed. What his own opinion may be on the subject does not appear, but he observes, " whatever may have happened formerly, there is so little proof of such an occurrence having taken place in later years, that the accident is in general altogether overlooked by writers on injuries of the head." (p. 65.) This observation, of course, does not refer to a fracture of the base of the cranium from a blow on the vertex, or on the back part of the head.

With respect to this latter accident, Mr. Guthrie dissents from the opinion of Mr. Earle and Sir C. Bell,—that the fracture of the base of the cranium depends on the occiput being forcibly impelled against the atlas, and thinks that it arises from " the superincumbent weight of the body pressing on the unsupported, flat, and thin base of the skull," (p. 65,) and seems to doubt that it can occur from a blow on the vertex. We do

not see that Mr. Guthrie's explanation makes the matter very clear : the
question is,— How is the force (whether it be the superincumbent weight
of the body, or anything else,) propagated so directly to the base of the
cranium as to produce fracture in that situation ? And this question has,
we conceive, been answered by a reference to the mechanism of the
cranium. If a force be applied to the vertex, the superior borders of
the parietal bones resist displacement downwards, inasmuch as their in-
ferior borders cannot be thrown outwards, in consequence of their being
supported laterally by the overlapping of the squamous portions of the
temporal bones ; while the temporal bones, as M. Malgaigne has pointed
out, are themselves supported by the zygoma, which constitutes on each
side a true buttress, sustained by the superior maxillary bone. A check
then applied to the vertex, is directly transmitted to the temporal bone,
and propagated through its petrous portion to the posterior part of the
body of the spheroid bone, the very parts which most fractures of the base
of the cranium traverse. The precise direction of the fracture must, of
course, vary with the direction in which the force is transmitted, but what
has been said sufficiently explains the general theory of its occurrence.

Though fractures of the base of the cranium are almost uniformly fatal,
because they are usually complicated with other more serious injuries, it
is yet generally admitted that recovery from the accident occasionally
occurs. Four cases are given (p. 66, et seq.) as examples of recovery
from this accident ; two of them probably were so, but in the absence of
a dissection cannot be unreservedly admitted as such : in the other two
cases, there was an opportunity for a post-mortem examination at a sub-
sequent remote period, and the previous occurrence of fracture of the
base of the cranium was placed beyond doubt. It is supposed that bony
union does not occur in fractures of the base, as it does in simple frac-
tures of the vault of the cranium, but that they terminate, in the event
of the patient surviving, in a false articulation as it were : no allusion is
made to this point in the account of the dissection, though some inci-
dental expressions lead us to suspect that bony union had not taken place
in either case.

Mr. Guthrie incidentally notices in the report of a case (p. 70,) that
very curious symptom, " the discharge of a fluid resembling water"
from the ear, a symptom " which," he observes, " is usually very dan-
gerous, as it flows from the sac of the arachnoid membrane." We quite
agree that this is a symptom of very bad omen, as we have witnessed but
one recovery amongst a considerable number of cases in which it occurred ;
but we cannot coincide with our author as to the origin of the fluid, in-
asmuch as we possess positive evidence from dissection, that it occurs
when the membranes of the brain are intact, and the cavity of the arach-
noid consequently not opened. The researches of Laugier also, if we
recollect right, for we have not his paper at hand, have already esta-
blished the same fact.

Mr. Guthrie has never met with a case in which the inner table of the
cranium was fractured, the outer table at the same time remaining un-
injured, and his observations respecting this very rare occurrence require
no particular remark. He has, however, collected most of the recorded
cases of the accident, which will be found useful and convenient for
reference. The same remark nearly applies to the observations on those

remote ill effects that occasionally follow wounds of the head, with or
without fracture or depression of the bone, and sometimes call for opera-
tive interference ; a number of very interesting cases recorded by others
are collected, and one is added from Mr. Guthrie's own practice, but no
general conclusions are deduced, and no rules are laid down for the
guidance of the practitioner, though the cases collected by our author
perhaps afforded sufficient materials for at least an attempt at so doing.
The case operated on by Mr. Guthrie himself, though there are several
analogous to it amongst those he has cited, deserves notice. A healthy
girl received a blow on the left side of the head from a stone, which was
followed by acute pain, which permanently marked the seat of injury, and
after a week she began to lose the power of moving the right arm.
Matters continued thus during twelve months, when the paralysis of the
arm suddenly increased. No further change occurred during the eleven
succeeding months, when she became affected with hemiplegia of the
right side, impaired sight, hearing, and memory, and occasionally slow,
almost stertorous respiration. All the ordinary remedies having failed to
relieve the symptoms, Mr. Guthrie, two years after the injury, removed
with a trephine " a disc of bone from the exact point in the parietal re-
gion to which she referred the pain. The portion of bone presented no
evidence of disease......the dura mater was quite healthy, and without
any very evident motion. On visiting her *an hour* after the operation,
she raised the previously paralytic arm several inches from her bed, and
was able to bend and extend the fingers. The pain in the head was
considerably less, and her countenance, before dull and heavy, was now
remarkably animated ; sensation had returned in the arm, and partially
in the leg." She was subsequently threatened with inflammation of the
brain, which was averted by bloodletting, and " in the course of three
days the paralysis had completely disappeared, sight and hearing again
became perfect, and, after passing through a speedy convalescence, she
quitted the hospital completely recovered." Some relapses of pain and
uneasiness in the head subsequently occurred, but she considered herself
" to have been cured by the operation ; although," observes Mr. Guthrie,
" I find it difficult to say in what manner it was effected, or why the re-
moval of the bone, which was in a perfectly natural state, should have
given relief." (p. 85.)

" The inner table is sometimes," Mr. Guthrie observes, " broken in a pecu-
liar manner, and to which I believe attention has only been drawn by myself in
my lectures, since trepanning has ceased to be the rule of practice in all cases of
fractures. It occurs from the blow of a sword, hatchet, or other clean cutting
instrument, which strikes the head perpendicularly, and makes one clean cut
through the scalp and skull into the brain. This kind of cut is usually considered
as a mere solution of continuity, and not as a fracture ; the bone being appa-
rently only divided, with scarcely any crack or fissure extending beyond the
part actually penetrated by the instrument." (p. 85.)

When the wound only implicates the outer table or diploë, it should
be treated as a simple incised wound of the scalp, but " when the sword
or axe has penetrated as far as, or through the inner table, the case is of
a much more serious nature ; for this part will be broken almost always to
a greater extent than the outer table, and will be separated from it, and
driven into the membranes, if not into the substance of the brain itself."
(p. 86.) Mr. Guthrie accordingly recommends that

" These cases should all be examined carefully. The length of the wound on the top or side, or any part of the head which is curved and not flat, will readily show to what depth the sword or axe has penetrated. A blunt or flat-ended probe should in such cases be carefully passed into the wound, and being gently pressed against one of the cut edges of the bone, its thickness may be measured, and the presence or absence of the inner table may thus be ascertained. If it should be separated from the diploe, the continued but careful insertion of the probe will detect it deeper in the wound; a further careful investigation will show the extent in length of this separation, although not in width, and will in all probability satisfy the surgeon that those portions of bone which have been thus broken and driven in, are sticking in or irritating the brain." (p. 86.)

When the nature of the case has been ascertained by the examination thus recommended, the question arises what should be the practice, and Mr. Guthrie replies,

" There can be no hesitation in answering, that in all such cases the trephine should be applied, although no symptoms should exist, with a view of antici- pating them ..... A patient very often survives a mere depression of the skull; he may, and occasionally does survive, a greater depression of the inner than of the outer table; but I do not believe that he ever does survive and re- main in tolerable health after a depression with fracture of the inner table, when portions of it have been driven into the dura mater. If cases could be advanced of complete recovery after such injuries, I should not consider them as super- seding the practice recommended, unless they were so numerous as to establish the fact, that wounds of the dura mater and brain by pieces of bone are not extremely dangerous. I have referred purposely to many cases in which a cure was effected after a lapse of time, by the bone being removed, but they rather support than invalidate the principle I have inculcated ..... I main- tain that the practice should be prompt and decisive in every instance in which the surgeon is satisfied that there is not merely a slight depression or separation of the inner table, but that several points of bone are driven into the dura mater." (p. 94.)

In discussing the treatment of depressed fracture Mr. Guthrie first adverts to the well-known fact that these injuries are less serious in the child than in the adult, and seems to consider that this fact has assisted in misleading those who advocate *La chirurgie expectante* in those cases at other periods of life; thus he observes, " If the records of sur- gery for the last twenty years be carefully examined, it will be found that the greater number of successful cases of recovery from depression, or from fracture and depression of the skull, which were not trephined, were in young persons, a fact which is deserving of the most serious atten- tion," (p. 102;) and again, " By far the greater number of cases in which recovery has taken place after fracture and depression of the skull, with injury of the brain and even loss of its substance, have occurred in children or in persons under the adult age," (p. 112;) and he concludes, " that a continuance of the most urgent symptoms can alone authorize the application of the trephine in children and young persons under fifteen or sixteen years of age," (p. 102;) and that " less frequent recourse may be had to the aid of operative surgery in order to prevent mischief than in adults, even when the bone is fractured as well as depressed," (p. 112,) a rule of practice already fully established and generally admitted.

In the case of adults, however, Mr. Guthrie is a decided advocate for early interference. Whenever a marked depression of the cranium occurs

in a person of mature age, he recommends us, if it be a simple fracture, to divide the scalp, and ascertain the nature and extent of the depression, as he thinks the difference between a compound and simple fracture " has been much exaggerated ; so much so, that he places no reliance on the supposition that there is more real danger in a case of fracture with depression, in which the scalp has been divided, than when it has been only bruised and not divided," (pp. 103-4,) a doctrine against which we must utterly protest. When the depressed bone has been thus exposed, we are told to proceed according to circumstances. Mr. Guthrie considers it " imperative to remove at once all portions of bone or foreign substances which may have or may be supposed to have penetrated the dura mater in adults, although no symptoms of compression should be observed." (p. 117.) Where the dura mater is not wounded, " there is more room for doubt ; and the surgeon must then decide, after the best estimate he is able to make of the probable evil which will occur from allowing the broken or depressed portions of bone to remain." (p. 112.) Whenever the bone, however, presses considerably or " unequally," to use Mr. Guthrie's own word, on the dura mater without wounding it, he seems to recommend that it should be elevated ; we say seems, for his expressions are occasionally somewhat vague. Such is the summary of our author's doctrines relative to this questio vexata in surgery; any commentary on our part would be superfluous, as our readers must be familiar with all that has been said by Larrey, Sir A. Cooper, Sir B. Brodie, and others, more or less favouring the rules of practice adopted by Mr. Guthrie, and equally so with the opinions of those who, with Dupuytren, Mr. Colles, and Mr. Lawrence, recommend us to postpone operative interference until the occurrence of symptoms shall imperatively demand it. We may however say thus much, that while we quite agree with Mr. Guthrie in the propriety of removing any portion of bone which wounds the dura mater, we dissent from his recommendation to operate in a case of mere depression without symptoms of compression.

The observations on flap-wounds, ecchymosis, and erysipelas of the scalp, require no particular examination ; though brief, they are excellent so far as they go. A case is mentioned where a portion of bone was sliced off with and adherent to a flap of the scalp; and on the parts being replaced in situ, both flap and bone adhered. (p. 96.) Some similar cases recorded by others are mentioned, but no allusion is made to the four remarkable cases mentioned by Larrey, in which sabre wounds sliced off, with the flap of the scalp, not merely a portion of the entire thickness of the cranium, but also of the meninges and of the brain, and the parts being replaced union and recovery ensue. (Clinique Chir., t. i. p. 140.)

The formation of pus between the dura mater and cranium seems to have been a much more common consequence of injuries of the head in the time of Pott and Deane than at present ; this Mr. Guthrie very properly attributes to the rigid antiphlogistic treatment and regimen now adopted in cases of injury of the head.

Mr. Guthrie does not consider wounds of the dura mater by any means so dangerous as they were supposed to be by Hunter, Sir A. Cooper, and we believe we may add, most British surgeons; and thinks that the arachnoid membrane, when wounded, is not so liable to diffused inflammation

as might be expected, "in consequence, probably, of the more equal pressure that is kept up within the skull than in the chest or abdomen." (p. 128.) He thence considers that British surgeons may, perhaps, be in error in not more frequently puncturing the dura mater, to admit of the discharge of blood or matter, and recommends this practice under the circumstances described in the following extract:

"I have seen, on the removal of a portion of the bone by the trephine, the dura mater rapidly rise up into the opening, so as to attain nearly the level of the surface of the skull, totally devoid, however, of that pulsatory motion which usually marks its healthy state; and an opening into it, under these circumstances, has allowed a quantity of purulent matter to escape, proving that the unnatural elevation of the dura mater was caused by the resiliency of the brain when the opposing pressure of the cranium was removed. I consider this tense elevation, and the absence of pulsation, to be positive signs of there being a fluid beneath, requiring an incision into the dura mater for its evacuation." (p. 125.)

Three cases are given in verification of these observations, two of them terminated fatally and one recovered.

The peculiarities attending gunshot wounds of the head, are adverted to briefly, yet perhaps sufficiently. Mr. Guthrie observes, that a musketball may sometimes, in penetrating the cranium, make a hole not larger than itself; but Larrey has observed that the orifice may be so small that the entrance of the ball would not be suspected, if we did not bear in mind that in young, or even middle-aged persons, in whom alone this can occur, the bones possess considerable elasticity, and the more elastic the bone the smaller the opening. (Clinique Chir. t. i. p. 213.)

Both at the commencement of the work (pp. 2, 3,) and again in the observations on gunshot wounds (p. 132), Mr. Guthrie maintains that wounds of the anterior part of the brain are more dangerous than those of its middle portion, and that those of its posterior part are attended with least evil. This statement is directly opposed to the opinion and experience of every practitioner with whose opinions we are acquainted, and is contrary to our own observation of the result of a considerable number of cases.

Four cases are mentioned of fracture of the skull through the orbit (pp. 137-8); the very deceptive nature of many of these cases, and the insidious manner in which the symptoms usually supervene, though well exemplified by the detail of two cases, might perhaps have been more specifically mentioned, for the benefit of the student, and even of some practitioners.

Mr. Guthrie recognizes two kinds of hernia cerebri, one that particularly described by Mr. Abernethy, "principally composed of coagulated blood;" the other, "formed for the most part of brain," as mentioned by Mr. Stanley and others; the former being much the more dangerous, and generally fatal, indeed uniformly so in our author's experience. Of the causes of the former he says nothing; that the latter are "the consequence of low inflammation of the brain, there can" we are told, "be no doubt." (p. 144.) Mr. Guthrie says that this kind of protrusion "rarely or never takes place when a considerable portion of the skull has been lost or removed, the brain being able to expand to such extent as the inflammatory impulse from within may render necessary. When the

opening, on the contrary, is small, and the dura mater has not been in-
jured, they have been seldom observed.   It is then principally when the
opening in the skull has been of greater extent than the size of one piece
of bone removed by the trephine, the dura mater having yielded, either
in consequence of injury or by ulceration, that this evil takes place ; it
is by no means, under proper treatment, a fatal, though it is always an
extremely dangerous occurrence." (pp. 138-9.)   Mr. Abernethy is the
only surgeon we can recollect who agrees with Mr. Guthrie in considering
that the loss of a considerable extent of the cranium does not favour the
occurrence of hernia cerebri.   Mr. Guthrie further states, " there can be
no doubt of the formation of many of these protrusions being aided by the
opening which has been made in the dura mater, which would have re-
strained their growth if it had been sound." (p. 144.)   Sir B. Brodie,
who has discussed this point, (Med. Chir. Trans. vol. xiv. pp. 396-415,)
entertains opinions the very reverse of Mr. Guthrie.   He considers that
the removal of a portion of the cranium " may in itself be sufficient to
make the patient liable to this formidable and dangerous disease of hernia
cerebri ;" and, in support of this opinion, appeals to cases in which,
" though the dura mater was found not to have suffered from the injury,
yet a *hernia cerebri* presented itself some days afterwards."   We have
ourselves seen the affection, both where the dura mater was wounded and
where it was not, and certainly consider that Mr. Guthrie attaches too
much importance to the lesion of this membrane, and too little to the ab-
sence of a portion of the cranium, as connected with the development of
this affection.   As respects the treatment nothing novel is advanced ; the
practice recommended is that inculcated by Sir A. Cooper, Dupuytren,
and others,—pressure, graduated and augmented according as the patient
can bear it.   Escharotics are of course condemned, and yet in one of the
cases appended (p. 141,) part of the treatment adopted consisted in touch-
ing the tumour with nitrate of silver.

The concluding pages of the work are occupied by some observations
on the impairments of intellect, &c., that occasionally follow injuries of
the head ; and on the operation of trephining ; on neither of which sub-
jects is anything said requiring observation.

We have laid so very full an analysis of Mr. Guthrie's treatise before
our readers, that it is scarcely necessary to add anything to the com-
ments which we have already occasionally made.   We must say, how-
ever, that we consider the work a valuable and seasonable addition to
medical literature.   We by no means agree in all Mr. Guthrie's doctrines,
but his opinions are entitled to a candid examination, and while we re-
tain our own views we shall not yet dogmatically pronounce his to be
wrong.   Did Mr. Guthrie's work do nothing but excite those, who have
opportunities for the task, to re-examine the more doubtful and litigated
questions connected with the treatment of injuries of the head, it would
effect much good ; but it does more ; for, putting aside any future results
it may produce, it must long remain a work valuable to the student for
instruction and to the practitioner for reference, as there can be no dis-
pute respecting the truth and value of the great majority of the doctrines
and rules of practice it contains, and few positions are advanced which
are not illustrated by appropriate and instructive cases.   Should a second

edition be called for, there are a few points which might be usefully treated of at greater length; but a much more essential improvement might be effected by the adoption of a more methodical arrangement, and a less diffuse and rambling style. It would almost appear as if Mr. Guthrie had strung together a number of detached notes, made at different periods, without much troubling himself as to the order in which he connected them. Be this as it may, defective arrangement characterizes the book; and this, together with diffuseness of style and occasional vagueness of expression, renders it sometimes difficult to detect the author's precise meaning, or to hunt out the passages relating to any particular point. Having said this much by way of censure, we conclude by cordially recommending Mr. Guthrie's treatise to the attention of our readers.

ART. XV.

The Natural History of Man; comprising Inquiries into the Modifying Influence of Physical and Moral Agencies on the different Tribes of the Human Family. By JAMES COWLES PRICHARD, M.D. F.R.S. M.R.I.A. &c.—*London,* 1843. 8vo, pp. 556.

ON a former occasion, (Br. & For. Med. Review, vol. XIII. p. 521,) we noticed this work with due commendation on the appearance of its early numbers. It is now completed, and forms one of the handsomest as well as most interesting volumes that have appeared for a long time. It has the rare merit of being equally suited to the well-informed general reader and to the medical professor; and we doubt not but it will attain, what it so richly merits, universal attention and approbation from the public. As we said on a former occasion, the work is worthy its distinguished author and of his former works, and we can give it no higher praise.

Our limited space forbids our entering at all upon an analysis of the work, but we must give our readers a general notion of its scope and objects, and how these are worked out by the author; and this we shall do by a few brief extracts from its own pages.

Object of the work. "It is the design of the following work, to furnish for the use of general readers, a brief and popular view of all the physical characteristics, or varieties in colour, figure, structure of body, and likewise of the moral and intellectual peculiarities which distinguish from each other the different races of men. It is likwise intended, in the same treatise, to comprise such an account of the nature and causes of these phenomena as the present state of knowledge will afford." (p. vii.)

Bearings of the question. "The sacred scriptures, whose testimony is received by all men of unclouded minds with implicit and reverential assent, declare that it pleased the Almighty Creator to make of one blood all the nations of the earth, and that all mankind are the offspring of common parents. But there are writers in the present day who maintain that this assertion does not comprehend the uncivilized inhabitants of remote regions; and that Negroes, Hottentots, Esquimaux, and Australians are not, in fact, men in the full sense of that term, or beings endowed with like mental faculties as ourselves. Some of these writers contend that the races above mentioned, and other rude and barbarous tribes, are inferior in their original endowments to the human family which supplied Europe and Asia with inhabitants—that they are organically

different, and can never be raised to an equality, in moral and intellectual powers, with the offspring of that race which displays in the highest degree all the attributes of humanity." (p. 5.)

The first step in the inquiry is an examination of the import of the terms *genus*, *species*, and *variety*, and the conclusion arrived at is briefly stated as follows :

" It seems to be the well-established result of inquiries into the various tribes of organized beings, that the perpetuation of hybrids, whether of plants or of animals, so as to produce new and intermediate tribes, is impossible. Now, unless all these observations are erroneous, or capable of some explanation that has not yet been pointed out, they lead, with the strongest force of analogical reasoning, to the conclusion that a number of different tribes, such as the various races of men, must either be incapable of intermixing their stock, and thus always fated to remain separate from each other, or, if the contrary should be the fact, that all the races to whom the remark applies are proved by it to belong to the same species." (pp. 17-18.)

The next stage of the inquiry comprehends a survey of the variations or degenerations undergone by plants and animals from climate, domestication, and other circumstances, and the result is given as follows :

" 1. That tribes of animals which have been domesticated by man and carried into regions where the climates are different from those of their native abode, undergo, partly from the agency of climate, and in part from the change of external circumstances connected with the state of domesticity, great variations.

" 2. That these variations extend to considerable modifications in external properties, colour, the nature of the integument, and of its covering, whether hair or wool; the structure of limbs, and the proportional size of parts ; that they likewise involve certain physiological changes or variations as to the laws of the animal economy ; and lastly, certain psychological alterations or changes in the instincts, habits, and powers of perception and intellect.

" 3. That these last changes are in some cases brought about by training, and that the progeny acquires an aptitude to certain habits which the parents have been taught ; that psychical characters, such as new instincts, are developed in breeds by cultivation.

" 4. That these varieties are sometimes permanently fixed in the breed so long as it remains unmixed.

" 5. That all such variations are possible only to a limited extent, and always with the preservation of a particular type, which is that of the species. Each species has a definite or definable character, comprising certain undeviating phenomena of external structure, and likewise constant and unchangeable characteristics in the laws of its animal economy and in its psychological nature. It is only within these limits that deviations are produced by external circumstances." (pp. 74-5.)

The application of these conclusions to the case of the human animal is obvious :

" Races of men are subjected more than almost any race of animals to the varied agencies of climate. Civilization produces even greater changes in their condition than does domestication in the inferior tribes. We may therefore expect to find fully as great diversities in the races of men as in any of the domesticated breeds. The influence of the mind must be more extensive and powerful in its operations upon human beings than upon brutes. And this difference transcends all analogy or comparison. *A priori*, we might expect to discover in the psychological characters of human races changes similar in kind, but infinitely greater in degree." (p. 75.)

To test this *à priori* argument by facts as they exist, the author enters upon a most elaborate and complete examination, physical, moral, and intellectual, of all the nations, tribes, and races of men found throughout the globe. To this survey the greater part of the volume is devoted. It is conducted with astonishing learning, admirable judgment, and in the most impartial and philosophical spirit. The following extracts contain, in a few words, an outline of the principal conclusions arrived at by the author:

1. *Physical or anatomical identity.* " The different races of men are not distinguished from each other by strongly marked, uniform, and permanent distinctions, as are the several species belonging to any given tribe of animals. All the diversities which exist are variable, and pass into each other by insensible gradations; and there is, moreover, scarcely an instance in which the actual transition cannot be proved to have taken place. Thus, if we consider the varieties of figure which are generally looked upon as the most important, and begin with those of the skeleton and the skull as their foundation, we shall find every particular type undergoing deviations and psssing into other forms. We have seen that, in many races who have, generally and originally, as far as we can go back towards their origin, heads of the pyramidal figure with broad faces, or the Mongolian type, the oval or European shape with European features display themselves in individuals, and often become the characteristics of tribes.

" Again, the shape of the head in the black races varies in like manner. The Sudanian nations have a black complexion and crisp hair, with a form of the head different from that of the negro ; and the type varies in particular tribes, and even in the same tribe. Towards the south, the black and crisp-haired Africans display, in the highland of the Kafirs, a form resembling the European ; and, in the country of the nomadic Hottentots, make a signal approximation to the physical character prevalent among the nomades of High Asia. Among the aboriginal races of the New World, similar varieties and similar deviations occur.

" With respect to colour, it is still more easy to trace the greatest variations within the limits of one race. There is, perhaps, not one great family of nations, having its branches spread through different climates, which does not display in this particular the most strongly marked varieties. It is true that among European colonists settled in hot climates such varieties are not so perceptible within a few generations ; but in many well-known instances of earlier colonization they are very clearly manifested. We have traced them in the instances of the Jews and Arabs, in the tribes of Hindoos, or rather of the Indian race, spread through India, compared with those of the Himálayan countries. We might add innumerable facts tending to bring out the same result.

" It has often been said that the native tribes of America present an exception to the general observation deduced from a survey of the nations of the Old World, and that the complexion of the Americans displays no relation to climate. We have proved, on the contrary, that tribes alike belonging to the American stock manifest the influence of external agencies not less distinctly than do the white inhabitants of Europe compared with the black races of Africa. Witness the comparison of the white Americans of the north-west coast with the black Californians.

" If any one should call in question the assertion that the colour of human races has any relation to the climates of different countries, we have only need to appeal to the most general and broadly marked facts which the history of mankind presents. Thus it is obvious that the intertropical region of the earth is the principal seat of the black races of men, and the region remote from the tropics that of the white races, and that the climates approaching to the tropics

are generally inhabited by nations which are neither of the darkest nor of the fairest complexion, but of an intermediate one. To this observation it may be added that high mountains and countries of great elevation are generally inhabited by people of lighter colour than those where the level is low, such as sandy or swampy plains on the sea-coast. Thus, if we begin with Africa, we shall find a great number of distinct races, as far as a total diversity of languages can be thought to distinguish men into separate races, spread over that great continent; and it may be observed that those whose abode is between the tropics, though differing from each other in many peculiarities, agree in the darkness of their complexion. In fact, if we divide Africa into three portions, we may define by the tropics the extent of the black complexion in its inhabitants. The nature of the hair is, perhaps, one of the most permanent characteristics of different races. The hair of the negro has been termed woolly: it is not wool, and only differs from the hair of other races in less important respects.

" The texture of the hair affords in the animal kingdom no specific characters. In mankind we find it in every gradation of variety; and if we take the African nations, I mean the black tribes who are apparently of genuine native origin, as one body, we shall discover among them every possible gradation in the texture of the hair, from the short close curls of the Kafir to the crisp but bushy locks of the Berberine, and again, to the flowing hair of the black Tuaryk or Tibbo. In some instances, indeed, it appears that the change from one to the other may be shown in actual transition." (pp. 473-6.)

2. *Physiological identity.* "The difference of climate occasions very little, if any, important diversity as to the periods of life and the physical changes to which the human constitution is subject; and that in all these great regulations of the animal economy, if we may use such an expression, mankind, whether white or black, are placed by nature nearly on an equal footing. As the duration of life and the age of adult growth is known to be nearly the same, it would be contrary to all probability should any material difference be found to prevail in respect to any one particular function or set of functions." (p. 486.)

3. *Psychical and moral identity.* "We contemplate among all the diversified tribes, who are endowed with reason and speech, the same internal feelings, appetencies, aversions; the same inward convictions, the same sentiments of subjection to invisible powers, and, more or less fully developed, of accountableness or responsibility to unseen avengers of wrong and agents of retributive justice, from whose tribunal men cannot even by death escape. We find every where the same susceptibility, though not always in the same degree of forwardness or ripeness of improvement, of admitting the cultivation of these universal endowments, of opening the eyes of the mind to the more clear and luminous views which Christianity unfolds, of becoming moulded to the institutions of religion and civilized life: in a word, the same inward and mental nature is to be recognized in all the races of men. When we compare this fact with the observations which have been heretofore fully established as to the specific instincts and separate psychical endowments of all the distinct tribes of sentient beings in the universe, we are entitled to draw confidently the conclusion, that ALL HUMAN RACES ARE OF ONE SPECIES AND ONE FAMILY." (pp. 545-6.)

It would be injustice to the author as well as the publisher if we did not call attention to the admirable manner in which this work is illustrated. It contains no less than " thirty-six coloured and four plain illustrations engraved on steel, and ninety engravings on wood." The greater part of these illustrations are portraits of individuals of every variety of the human family, especially of the more uncivilized tribes. Looking at these and at the way in which the whole work is got up, we must in justice withdraw the charge we formerly made of its being too-high priced. The first numbers gave us no reason to expect that the illustrations would be so numerous and beautiful as they really are.

Art. XVI.

The Anatomy of Sleep, or the Art of procuring sound and refreshing
Slumber at will. By Edward Binns, m.d. &c.— *London*, 1842.
8vo, pp. 394.

This is a comical, pantosophical, popular sort of book, the author of
which appears to be in extremely good humour with himself and every-
body else. Its more immediate object is to communicate to the world
the important secret of procuring sleep at will. Dr. Binns lays no claim
to the discovery of this secret, which he attributes to the late Mr. Gardner,
but has thought fit to accompany its announcement with a copious in-
quiry into the philosophy of sleep ; and has produced a volume which,
though its subject be sleep, and though it bear on its title-page a four-
post bedstead with sumptuous hangings, has decidedly no hypnotic ten-
dency during the perusal, but keeps us wide awake by a succession of
wonderful narrations and posing questions, and a variety of matter em-
bracing everything from metaphysics to cosmetics.

Dr. Binns commences by defining sleep as " the art of escaping re-
flection,"—a definition which we consider very faulty, first, because sleep
is not an art, and secondly, because reflection is not always entirely
banished during sleep. Precision in the use of terms is by no means one
of our author's characteristic excellences: he here calls sleep an *art ;* in
another place he calls sleep a *property*, a *faculty*, and death a *quality*.

In the second and third chapters, and the thirteenth, which in natural
sequence should have followed them, a popular view is taken of the or-
ganization, functions, and classification of living beings, which may
prove in some degree instructive to the general reader.

In chapter the fourth the author makes some remarks on the physio-
logy of *natural sleep*, and the subjects of dreaming and somnambulism
being touched upon, lead to that of *animal magnetism*. The observations
of the " Times" on the exhibitions of M. Lafontaine, and those of the
" Medical Times" on the experiments of Dr. Elliotson, are quoted at
full length. Dr. Binns informs us that he himself witnessed the per-
formances of the first-named gentleman " in silent wonder not unmingled
with incredulity,"—a very proper frame of mind on such an occasion.

Chapter the fifth treats of *prolonged sleep* and *trance*, and contains
the alarming announcement that many persons are annually buried alive
—which we slightly doubt. That such an event has occasionally hap-
pened is, however, but too true, and our author cites a number of in-
stances, some of a horrible and others of an interesting or ludicrous
character.

Chapter the sixth treats of *hybernation*, and the dormant vitality of
animals and vegetables, but contains merely the common-places of these
subjects. In the succeeding chapter Dr. Binns reverts to *somnambulism*.
He adopts the opinions of Gall with respect to the physiology of that
state, and cites various cases illustrative of its phenomena. The eighth
chapter is on *catalepsy*, and consists almost entirely of cases, — some
properly referrible to this head and others not so. Chapter the ninth
is devoted to the subject of dreaming. It contains numerous anecdotes
of extraordinary dreams and coincidences, and some sufficiently sensible

remarks on the rationale of such occurrences, none of which, however, have any claim to originality. Chapter the tenth is on *hallucination*, and is of a very rambling character. It begins by defining hallucination as " a difficulty of feeling or appreciating external relations with which we are in connexion." We must profess our inability to comprehend the meaning of being in connexion with a relation, seeing that connexion is a relation. The examples adduced by Dr. Binns are extremely heterogeneous, involving various cases of insanity and depravation of the external senses, and one, at p. 231, in which we cannot trace any hallucination, but simply the natural effects of intense grief in a person of strong attachments. The next chapter is on *fainting, asphyxia,* and the *various modes of death.* The commencement of this chapter affords a remarkable exemplification of the inaccurate use of terms which is one of our author's besetting sins:

" As that temporary, or sometimes prolonged, or often fatal interruption to the phenomena of life, called FAINTING, a condition of the body which may be induced by terror, exposure to mephitic gases, hemorrhage, suffocation, suspension or strangulation, and called by medical writers SYNCOPE, or ASPHYXIA, literally signifying want of pulse, cannot be classed among bodily diseases, and as it is analogous to trance, and in fact, differs from that affection only in degree, it will require a short notice at our hands." (pp. 257-8.)

Among the numerous striking narrations of the fate of those persons whose earthly pilgrimage has come to an äerial termination in front of the Old Bailey, we do not recollect to have ever seen the term "fainting" applied to the effects of suspension. We would suggest to the gentlemen of the daily press the occasional substitution of " swung off in a syncope" for " launched into eternity," the latter phrase having become stale and vapid through frequent iteration. The popular reader will meet in this chapter with some information as to the several ways in which our " fiery particle" may be extinguished, and divers wonderful instances of resuscitation after apparent death.

On the subject of *mesmerism,* treated by Dr. Binns in his twelfth chapter and elsewhere, we shall not at present dwell, as we may possibly ere long enter into it in detail. We must, however, protest against such precipitate conclusions as the following, which we find in the sixteenth chapter :

" It cannot be too frequently repeated, that mesmerism depends upon the presence of a fluid passing from one body to another, and not to [upon] monotonism ; and that the mesmeric state is consequently as distinct from that of normal sleep, as the apoplectic stupor from refreshing slumber."

This position is supported by a very singular argument, amounting to as neat a *lucus à non lucendo* as could possibly be wished for :

" We infer the presence of this fluid from the fact, that ' if we examine with a microscope the naked body, exposed during summer to the rays of a burning sun, it appears surrounded with a cloud of steam, which becomes invisible at a little distance from the surface. And if the body is placed before a white wall, it is easy to distinguish the SHADOW OF THAT EMANATION.' This is *not* the mesmeric fluid ; but the time *may not* be far distant when the ingenuity of man may contrive a mesmerometer, as we have already electrometers, and that fluid be known also not only from its effects but from its composition ; and the problem be solved whether it be a simple or a compound body." (pp. 375-6.)

The author adds in a note, "The word fluid is used not in its general sense, but we can find no other word to express conveniently mesmeric influence." But if we are to hope that we shall one day be able to ascertain the composition of this thing (so we must call it for want of a better term), that hope can rest only on the conviction that it is material; again it is pretty clear, admitting it to have any existence at all, which we neither affirm nor deny, that it is not a solid, and if so what can it be but a fluid ?

In chapter the fourteenth the seat and constitution of the mind are considered. Dr. Binns adheres to the phrenological view of the cerebral functions, and concludes in a manner which engenders the hope that we are at length approaching the proper subject of this very comprehensive publication.

"From these cases, and the facts and arguments which have preceded them, it will be seen that the brain consists of a congeries of organs, whose functions are especially distinct and appropriated for particular purposes; that it is the seat of the intellectual powers; that in it essentially resides the principle of vigilance or wakefulness; and that we must therefore look for the organ or faculty of sleep in some other part of the body; and with a view to facilitate inquiry, we shall proceed, in the next chapter, to the description of SLEEPLESS-NESS OR VIGILANCE."

In the two concluding chapters of the work the actual nature of sleep and the means of inducing it are considered. Dr. Binns regards sleep not as the suspension of certain functions, but as a positive state resulting from the activity of a certain portion of the nervous system. We give his views in his own words :

"That the state of fatigue in any particular organ is not exactly the same as its condition in sleep, we infer from the fact, that over-fatigue or over-excitement, or excitement ever so trifling of the voluntary organs, if we happen not to be accustomed to it, will often prevent instead of predisposing or inducing sleep. Again, we sleep periodically and at stated times, whether fatigued or not, while many possess the faculty of sleep at will, at all times and all places. We are told by Bourrienne that when Napoleon was at Tilsit, sitting in a chair next the Emperor Alexander of Russia, and witnessing the performance of the Cid of Corneille, suddenly in the very midst of the representation, as if wishing to abstract himself from the mimic scene before him, folded his arms, reclined his head upon his chest, and was sound asleep. Here was the exertion of a faculty —a power distinct from the mere condition of fatigue; it was functional manifestation of some organ within the body. But where is this organ situated? In the cerebrum, cerebellum, or medulla oblongata? We think in no one of these organs, but that we are to look for it in the medulla spinalis or spinal cord, and that it will be found between the cervical and lumbar vertebræ in the GANGLIA formed from the nerves given off by this portion of the spinal column. The reasons which induce us to place it in this region are, that sleep is intimately connected with respiration, that the true functions of the spinal cord have never been satisfactorily ascertained; that the ganglionic system is the antagonism of the cerebral; and lastly, that no phenomena can arise, or can manifest themselves in the body purely from the cessation of activity of any organs, but must owe their presence to some direct cause." (pp. 385-6.)

It is the true saying of Samuel Johnson that " on the arena of conjec-ture all men stand equal who are equally well informed;" and on this principle we leave Dr. Binns in quiet possession of his theory.

It has long been known that monotony, or a continued repetition of

similar impressions on the mind or senses, was a powerful agent in producing sleep; but according to our author, this was first reduced to a principle by Mr. Gardner. The results obtained by Duncan, Braid, Catlow, and others, are all referred by Dr. Binns to this principle, which he calls *monotonism*: he considers such phenomena as belonging to those of "enhanced normal sleep," and by no means as identical with those of mesmerism, which arise from the agency of a pecular fluid. But it would be tantalizing the reader to withhold from him any longer the *arcanum magnum*. Here it is! Suppose a man cannot sleep:

"Let him turn on his right side, place his head comfortably on the pillow, so that it exactly occupies the angle a line drawn from the head to the shoulder would form, and then slightly closing his lips, take rather a full inspiration, breathing as much as he possibly can through the nostrils. This, however, is not absolutely necessary, as some persons breathe always through their mouths during sleep, and rest as sound as those who do not. Having taken a full inspiration, the lungs are then to be left to their own action; that is, the respiration is neither to be accelerated nor retarded. The attention must now be fixed upon the action in which the patient is engaged. He must depict to himself that he sees the breath passing from his nostrils in a continuous stream, and the very instant that he brings his mind to conceive this apart from all other ideas, consciousness and memory depart; imagination slumbers; fancy becomes dormant; thought subdued; the sentient faculties lose their susceptibility; the vital or ganglionic system assumes the sovereignty; and as we before remarked, he no longer wakes but sleeps." (p. 391.)

This plan, Dr. Binns tells us, has never failed, so far as he knows, but in two instances. We are happy to say that our own proclivity to repose at the proper hour, (enhanced, no doubt, by the peacefulness of our editorial conscience, which allows us "to sleep in spite of thunder" from Dr. Paine and other malcontents,) has not given us an opportunity of trying Dr. Binns's soporific; some of our friends, however, have made a few trials of it, but have not found it succeed in one. Such are the diversities of human experience! We think it very probable, however, that the respiration may be so regulated as to favour sleep, and we recommend the subject to the attention of our readers.

Such are the general contents of Dr. Binns's book, and we wish we could dismiss it without noticing the inaccuracies both as to facts and references with which it abounds. The author seems generally to cite from memory, a very dangerous practice, unless the memory be an unusually good one, as will appear from the following examples, to which many others might be added. At p. 121, Byron's "sentimental savage," as applied to Isaac Walton, is changed into "sentimental sinner," and the humour of the expressiou thereby destroyed. At p. 279 the poet Cowley is made to hang himself over his chamber-door in the Temple. Dr. Binns here confounds Cowley with Cowper; the former never lived in the Temple, nor, as far as the world knows, ever attempted suicide. At p. 371, the experiments and views of Dr. Kellie with respect to the cerebral circulation are attributed to Dr. Abercrombie. &c. &c.

With all its defects, however, we think it but just to say that the "Anatomy of Sleep" is an entertaining book, involving a variety of general information. We have no doubt that it will be read by many with much amusement, and not without some edification.

Art. XVII.

A System of Practical Surgery. By William Fergusson, f.r.s.e.,
Professor of Surgery in King's College, London ; Surgeon to King's
College Hospital, &c. &c. With 246 Illustrations by Bagg.—*London*,
1842.   8vo, pp. 596.

The object and nature of this volume are thus described by the author:

"The present work has not been produced to compete with any already
before the profession: the arrangement, the manner in which the subjects have
been treated, and the illustrations, are all different from any of the kind in the
English language.   It is not intended to be placed in comparison with the ele-
mentary systems of Mr. Samuel Cooper, Mr. John Burns, Mr. Liston, Mr. Syme,
Mr. Lizars, and that excellent epitome by Mr. Druitt.   It may with more pro-
priety be likened to the 'Operative Surgery' of Sir C. Bell, and that of Mr.
Averill, both excellent in their day, or the more modern production of Mr.
Hargrave, and the 'Practical Surgery' of Mr. Liston, which are so well known,
and so justly appreciated. ...... There are subjects treated of in this volume,
however, which none of these gentlemen have noticed, and the author is suf-
ficiently sanguine to entertain the idea, that this work may, in some degree,
assume that relative position in British surgery, which the classical volumes of
Velpeau and Malgaigne occupy on the continent." (Pref. ix.)

Having in this extract given the author's own account of the work, we
shall briefly state the nature of its contents, and try to enable our
readers to appreciate how far Mr. Fergusson has succeeded in attaining
his object.

The first section of the work treats of the "elements of practical
surgery," and has been properly introduced with a view to avoid frequent
repetitions elsewhere, which could otherwise have been scarcely avoided.
Under the term practical surgery Mr. Fergusson says he includes "the
symptoms of disease and injury, the principles and objects of treatment,
and such medicinal means of cure as seem to me to belong to the pro-
vince of surgery." (p. 2.)   The remainder of the work is in fact a treatise
on operative surgery : it is divided into four sections, in which the superior
extremity, the inferior extremity, the head and neck, and the chest,
abdomen, and pelvis, are respectively treated of under the several heads
of dissection, dislocations, fractures, and the various operations that are
liable to be performed in each particular region.   It is of course impos-
sible that we should give an analysis of a book thus embracing nearly the
entire province of surgery ; but we shall endeavour to estimate its general
character, and to convey a fair and just idea of Mr. Fergusson's matter
and manner.

And first we must observe that we have formed a decidedly favorable
opinion of Mr. Fergusson's work ; we have been surprised that so many
important matters could have been so well stated in so small a space ;
but we have at the same time been struck with some imperfections and
deficiencies, which we deem it our duty to notice.

The chief blemish of the work is, that some points are so superficially
treated that the information conveyed respecting them is very imperfect,
we might say useless for practical purposes.   This observation applies
more particularly to the section "elements of practical surgery."   So
much of it as relates to what is commonly termed "lesser surgery" is
full and satisfactory, but some of the subsequent articles are superficial

and meager : in some instances important practical points are mentioned but not discussed, the proposition is enunciated but there is no attempt at its solution, no rules laid down for its practical application, and in other instances the symptoms of disease are disposed of with similar brevity.

Thus, for example, in discussing the treatment of inflammation, after the ordinary antiphlogistic measures are enumerated, we are told :

" Besides these measures, which may be said to constitute the most important parts of the constitutional treatment of inflammation, there are others, which often are of the last consequence, such as opiates, to allay irritation, and stimulants, to rouse the depressed and sinking powers of life. The exhibition of camphor, ammonia, and wine may prove of the utmost value in certain cases, which form, as it were, the exceptions to the general practice of constitutional depletion, which is so universally admitted as being the proper course to pursue in the treatment of this disease." (p. 52.)

These observations would constitute an excellent introduction to an account of the characters and symptoms of the class of cases referred to, but there is literally not one word on that point ; we are merely informed that such cases do exist. In speaking of the signs of suppuration, the fallaciousness and insufficiency of the general symptoms as indicative of its occurrence, is clearly and judiciously pointed out, the importance of fluctuation as a diagnostic sign is then mentioned, and it is said (p. 61), " the feeling of fluctuation is well understood by the person who has once placed the fingers of one hand over the collection of matter, and tapped gently on the swelling with those of the other."   We could have wished for more detail respecting the important practical points of the mode of detecting fluctuation, and of the deceptions both positive and negative that may so readily occur in attempting to do so ; and we may further remark that œdema, occasionally so important an indication of the formation of deep-seated matter, is not hinted at.

In the chapter on erysipelas (p. 87, et seq.) there is, we may literally say, not one single word respecting the symptoms of the affection ; the disease is *assumed* to be known.   Again in the account of the diagnosis of aneurism (p. 106), the ordinary symptoms are well and clearly detailed, and it is then stated that some of those " symptoms are occasionally indistinct, and others not altogether to be relied on."   This is very true ; but we see little use in mentioning the fact without appending an appreciation of the comparative value of the symptoms, and an account of the methods of endeavouring to establish a diagnosis in an obscure case, which is not done.

The portion of the work in which the affections incidental to each region are described is nearly free, yet not absolutely exempt, from faults of the kind we are now noticing.   Thus there is positively no account given of the symptoms of dislocation of the radius either backwards or forwards, further than that of the latter accident we are told " it seems to produce little inconvenience, saving a slight diminution of flexion and extension, more particularly of the former." (p. 157.)   It is needless to say that the symptoms of these accidents are characteristic enough, and that they cause much pain and inconvenience at and for some time after the period of their occurrence.   As to the treatment of these accidents, Mr. Fergusson says " where either of these injuries is detected at first, the

head of the bone should be drawn by extending or bending the elbow, or perhaps thrust at once into its proper position." It would have been shorter, and practically just as useful, to have said, "These dislocations when detected should be reduced." They usually are easily replaced; but we know from experience that their reduction is sometimes difficult enough unless the forearm, while being flexed, is also simultaneously pronated or supinated, according as the displacement is forwards or backwards. With respect to dislocations of the forearm backwards, we are simply told "the nature of the accident will be readily made out by any one acquainted with the anatomy of the joint." (p. 157.) Again there is no hint of the peculiar symptoms of fracture of the lower end of the radius, of the imperfections it may produce in the motion of the hand if not successfully treated, or of the difficulties in the way of so treating it. (p. 175.) Such omissions have struck us the more, as the plan of the work includes "the symptoms of disease and injury," (p. 2,) and as we find some points of secondary interest, because of very rare occurrence, discussed at some length, e. g. : the propriety of operating for aneurism while a female is pregnant. We must not, however, be understood as implying that superficial and defective description of the symptoms and treatment of disease and injury are characteristics of Mr. Fergusson's work; on the contrary, the instances of such defects which we have noticed, with some others that we might notice, constitute the comparatively few exceptions; and perhaps on that very account have the more forcibly attracted our attention.

We must also object to the way in which several both of the minor and greater questions of surgery are dogmatically decided, without any discussion, without any reasons assigned for the conclusion at which the author arrives. Thus at p. 96 we find it stated that "inflammation is the inevitable consequence of all wounds :" but surely this is at the least an important unsettled question; the reasoning and facts adduced by Dr. Macartney are not to be thus cavalierly disposed of; and the phenomena of subcutaneous wounds, which are discussed in this very chapter, should make us hesitate in arriving at such a dogmatic conclusion. At p. 155 dislocations of the wrist, without any accompanying fracture, are unreservedly admitted as of common occurrence, and no hint is given of the difference of opinion existing on this point among surgeons of the greatest experience. At pp. 92 and 318 the danger of operative interference with veins is decidedly underrated. There is indeed some discussion on this point, so that perhaps a notice of Mr. Fergusson's opinion respecting it is here misplaced; we may, however, observe that Mr. Fergusson regards the prevalent notions respecting the danger of certain operations on the veins as decidedly exaggerated, an opinion partly formed on the alleged success of some French practitioners in these operations. Almost while we are writing these lines we have read of two fatal cases of phlebitis following the application of needles for varix of the lower extremity, which occurred in the practice of Roux, and are published in the Gazette des Hôpitaux, Nov. 5th. With respect to the great question of the occasional occurrence of death from the entrance of air into a vein during the performance of an operation in the vicinity of the neck, Mr. Fergusson says "a few globules which may accidentally be admitted cannot do that harm which some have imagined." No one, we believe, ever

imagined that the introduction of a *few globules* could do much harm, and we do not approve of so brief and inconclusive a decision of so important a question, the more especially as we believe it to be positively demonstrated that death has in *many* instances occurred from the accident in question.   And here we may be allowed to mention that another example of this lamentable event has been communicated by M. Gomé to the Academy of Medicine of France so lately as the 3d of November.

Having now exhausted every topic of blame, we gladly apply ourselves to the more grateful task of laudatory comment; and as we have not hesitated to find fault when we considered it called for, our praise we trust will carry with it the greater weight.

The surgical anatomy of each region is described in a manner at once clear, compendious, and well calculated, as the author desires, to " encourage ocular inspection" rather " than to facilitate the prevalent, baneful, and schoolboy system of acquiring names from printed lessons." (Preface, p. viii.)   The plan of this portion of the work has, in our opinion, been admirably conceived and as well executed.

We extract the following observations respecting the diagnosis of malignant tumours as an average specimen of Mr. Fergusson's semeiological and diagnostic details, and because the fact that it is but an average specimen sufficiently shows that our former strictures apply to but a comparatively small portion of the book :

" The symptoms do not always indicate the character now under consideration (malignancy). For instance, pain is not a test of malignancy ; for the most painful of all, perhaps, is the painful subcutaneous tubercle, which, however, is not malignant ; whilst, on the other hand, medullary sarcoma, one of the most malignant of all growths, is not characterized by remarkable pain.   The peculiar pricking, lancinating pain of scirrhus, is often a good test of the disease, but frequently such tumours are met with in which this symptom is by no means conspicuous.   Rapid growth is probably a more certain test of malignancy, but many exceptions to this may be met with also.   I am most inclined to take as good criteria the apparent effect which tumours have upon the constitution, and the extent of their connexion with the neighbouring parts.   If a patient, after a growth has existed for some time, gradually loses flesh, becomes pale and languid, has constant uneasiness if not pain in and around the part, I consider these good grounds for suspicion that the affection is malignant ; and if, in addition, the local disease has no distinct limits, (in other words, if the exact line of separation between the sound and affected parts cannot be made out,) if the tumour be in a manner fixed, if the skin over it does not appear healthy, however much it may be stretched, and does not glide over the swelling, and if the latter does not move readily on the subjacent parts ; if, added to these, the whole, or a great part of the thickness of a limb, or wherever the disease may be, seems to be more or less involved, there need be little doubt that the disease is malignant.   Some objections to these general characters will at once be perceived ; as, for example, a tumour of bone cannot be moved like one of the soft parts ; and, in certain instances, there are additional characters which indicate peculiar diseases, as the ulceration in the latter stages of scirrhus, or the bleeding growth in fungus hematodes." (pp. 120-1.)

The comparative appreciation of the flap and circular methods of amputation affords a fair example of the candid and judicious manner in which Mr. Fergusson discusses an important surgical question, especially when we consider that it is written by one who himself almost invariably adopts the flap operation.

"If rapidity of execution is to be taken as the test of superiority, then I imagine that the flap operation must be allowed the preference, but in the hands of a good surgeon the difference of time required for the efficient performance of either, seems to me of so little consequence, that such a calculation should not be taken into account . . . . . I cannot but think that the same hand which rapidly and safely completes the flap incision, would with almost equal facility, if equally well trained, accomplish the circular. . . . . A surgeon of the present day who takes more than from thirty seconds to three minutes (excepting under peculiar circumstances) for the performance of an amputation, whether flap or circular, ought not in my opinion to be taken as an authority on the subject. I would therefore set aside the question of time in such an argument as that to which I now allude. The comparative extent of cut surfaces in the respective operations seems to me of trifling import; a few inches more or less, provided always that a good stump is left, will never in my opinion determine the issue of an amputation. The bleeding during such a proceeding is greatly, perhaps entirely, under the control of the surgeon. It has been asserted by Sir G. Ballingall and others, that the vessels retract more completely in the circular operation. . . . . It must be admitted, however, that if the bleeding is more copious in the flaps, it is easier to get at the deep part of the wound than in the hollow cone of the circular incision. . . . . It has been asserted in most controversies on this question, that in the circular operation the skin alone is left to cover the end of the bone, whereas in the flap method there is a cushion of muscular fibres preserved which afterwards protects that part, and lessens the chance of injury from pressure. The nature of the covering, however, depends greatly on the manner in which the operation is performed. . . . If the incisions are so managed as to leave a sloping surface from the edge of the divided bone to that of the skin, and if a sufficiency of soft parts be left, the covering of the bone may thus be as thick (as muscular) as by the flap operation. . . . Whether the operation has been by flap or by circular wound, the stumps are at last so much alike in certain parts of the body, that it is occasionally difficult after the lapse of years to say whether an amputation has been by one mode or the other : at all events, when such distinction can be drawn from the shape of the cicatrices, it is evident that the end of the bone is covered by much the same thickness of soft parts in one instance as in the other. . . . . Non-union, suppuration, and granulation, may happen from one operation as well as the other. . . . I feel bound to state, that I have seen adhesion by the first intention follow as perfectly after the circular operation as after the flap ; and, in addition, I have seen as good stumps from the one as the other." (pp. 126-8).

In describing the particular operations, Mr. Fergusson contents himself with detailing those methods which in each case he thinks deserve the preference ; thus he does not describe the twenty or thirty different modes which have been proposed for amputation at the shoulder-joint. He inculcates a study of the anatomy of the parts rather than of the detail of printed opinions :

"I do not mean by these remarks to discourage the study of the opinions and proceedings of many who are justly considered our best authorities on such matters ; but, as it is not within the compass of this work to describe, or allude to all that has been said or done in surgery, or to point out the trifling shades of difference in the practice of twenty or thirty individuals—each of whom, be it remarked, is an authority perhaps equal to any other,—I shall rest satisfied with describing two methods which I have myself resorted to on the living body, after having given to most of the others a fair consideration and trial on the subject." (p. 230.)

The various methods recommended by the author for the performance of every operation of any importance, are described with great clearness and precision, selected with great judgment, and most admirably illus-

trated by woodcuts that in design and execution leave nothing to be
wished for, and which, instead of being collected at the end of the volume,
are intercalated with the text, so as to most conveniently aid the reader
in following the descriptive details which they so well exemplify.   Mr.
Fergusson, we may here observe, makes light of many rules to which very
undue importance have been attached in the performance of certain ope-
rations; as an example of this we may refer to his observations on ampu-
tation of the leg, with reference to the supposed necessity of the surgeon
standing on a certain side of the limb, and sawing the fibula before the
tibia is divided. (p. 354-5.)   We fully concur in the justice of these and
other similar observations, and may add that our author has not gone
too far in this direction, as he carefully notices those rules that are
essential for the convenient and safe achievement of almost every im-
portant operation.   A few extracts will best show how far this opinion is
well founded.

In describing excision of the elbow-joint, Mr. Fergusson says:

"The main object in such a proceeding is to remove all the diseased portions
of bone, and this ought to be accomplished with as little injury to the sur-
rounding parts as circumstances will permit. By laying open certain sinuses,
which may exist in some instances, sufficient room may be obtained, but
in general it will be better to make either a crucial incision + or one in the
form of H.   The posterior surface of the joint is evidently the most eligible
part to make a free opening, the large artery and nerves, with the exception
of the ulnar, all lying in front, being separated, too, from the bones by the
brachialis anticus muscle.   The operation is accordingly always done on the
dorsal aspect.   The patient may be either laid on a table with the face down-
wards, or be seated on a chair; the former position ensures greater steadiness
on his part, and I have seen it most frequently preferred, but the latter I have
myself selected, as I think the operator can so move the arm as to enable him
to inspect the ends of the bones more accurately than whilst the patient is kept
on his face. I believe however the position of the patient is of less moment
than some seem to imagine; whichever attitude is fixed upon, the arm and fore-
arm should be firmly held by an assistant, then if the extent of the disease is
not supposed to be great, a crucial incision should be made directly over the
olecranum; but if, on the contrary, a free exposure of the parts be deemed re-
quisite, the other incision should be selected. On raising the flaps, which
should consist of the entire thickness of the skin, as well as the condensed and
infiltrated cellular texture underneath, the olecranum process will be laid bare;
in cutting on its inner margin, the ulnar nerve must be carefully preserved from
injury, which can be best done by carefully dissecting it out of its position be-
hind the internal condyle at this stage of the operation, and holding it aside
with a blunt hook during the future steps; the attachment of the triceps should
next be divided, and the cutting forceps used to separate the olecranum from the
ulna. The surgeon will now be enabled to appreciate the condition of the
articular surfaces more clearly than heretofore; and will be guided in his
future steps by the apparent extent of the disease. He may now, with the
forceps, divide the remaining portion of the upper end of the ulna, the head of
the radius, and whatever part of the humerus he may deem necessary. In the
adult the saw may be necessary for the latter purpose, but in a young patient
there is no difficulty in effecting this object with the instrument recommended,
and occasionally the gouge may be of service in scooping away small spots of
the carious surface which cannot be reached by either forceps or saw. . . . . . .
In some instances the lateral ligaments must be cut through, to allow the ends
of the bones to be fairly turned out; and in all cases of extensive disease, this
had better be done at once; in doing so, however, there is no necessity for ex-

posing such an extent of their shafts as was formerly deemed requisite, as the saw may be used with perfect ease, without the presence of a broad spatula in front of the bone, as is recommended by some even in the present day; indeed, the method of removing the diseased portions of bone here described, seems to me to constitute a most important difference from that resorted to by Moreau, who, in separating the 'enlarged and rough' end of the humerus, doubtless went far beyond the actual disease, and thus made the wound unnecessarily extensive and severe......I hold it to be of the utmost consequence, in the performance of this operation, to distinguish between caries and that enlarged and hardened condition of the bone in the immediate vicinity of this disease, which, though altered in structure, may be allowed to remain, whilst, to ensure success, the former must be taken away......It most commonly appears that the caries is limited to the articular surfaces, or their immediate vicinity; and though large portions of the shafts of the bones have been occasionally removed with success, when the disease has necessitated such extensive wounds, a judicious advocate for excision would, in all probability, in such a case give a preference to amputation." (pp. 205-7.)

We had marked some other passages for quotation, but must abstain from extracting them, as we have already said enough to convey an adequate idea of the nature and execution of Mr. Fergusson's treatise, which ought to be in the hands of every surgeon. We must, however, make room for the following passage, in which an ingenious method was adopted for restoring the symmetry of the nose:

" A patient of mine, (a young gentleman who had been somewhat vain of his personal appearance previously, and not without good reason,) was left in the condition represented in fig. 206. The columna and the cartilaginous septum had been destroyed, and the vomer had separated by necrosis. Here I imagined that a modification of the proceeding of the Berlin professor might be advantageously resorted to, and accordingly proceeded thus. The patient being seated, the point of a small scalpel was introduced under the apex, and the alæ were separated from the parts underneath; next the knife was carried on each side between the skin and the bones, as far as the infra-orbital foramen, taking care not to interfere with the nerves, when by passing the point of my finger below the nose, I caused the latter organ to be as prominent as could be wished. I now pushed a couple of long silver needles, which had been prepared for the purpose, with round heads and steel points, across from one cheek to the other, having previously applied on each side a small piece of sole leather perforated with holes at a proper distance, then I cut off the steel points, and with tweezers so twisted the end of each needle as to cause the cheeks to come closer to each other, and thus render the nose prominent......thus by bringing the cheeks more into the mesial line, a new foundation, as it were, was given to the organ." (pp. 453-4.)

The operation, to judge from the woodcuts annexed, succeeded perfectly.

We may refer to the account of dislocation of the hip-joint, of hernia, of operations on the superior and inferior maxillæ, and on the great arteries in the neck, as a few out of many examples, showing what a mass of valuable information respecting some of the most important points in surgery, Mr. Fergusson has contrived to compress within very moderate limits. We must, however, conclude. It is scarcely necessary to say, that we deem Mr. Fergusson's work to be very valuable, and practically useful: any little imperfections we have noticed are far outweighed by its merits; and the present treatise cannot but enhance the reputation of its author as a judicious and experienced practitioner. The woodcuts are in Bagg's happiest manner, and are indeed beyond all praise.

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ART. XVIII.

Descriptive and Illustrated Catalogue of the Physiological Series of
Comparative Anatomy, contained in the Museum of the Royal College
of Surgeons in London.—London, 1833-41. Five Vols. 4to, pp. 1244.
With numerous Plates.

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SOME of our readers may perhaps think a catalogue an inappropriate
subject for review; but when it is considered of *whose* collection this
catalogue gives an account, and by *whose* labour it has been perfected,
we are sure that even they will feel our notice of it to be called for, not
merely as directing their attention to the treasure they possess, nor simply
as pointing to the amount of information to be derived from this descrip-
tion of it, but as an appropriate tribute of gratitude for the patient devo-
tion, on the part of Mr. Owen, of his eminent talents, during so many of
the best years of his life, to the completion of this object for the benefit
of the public.

But the object was not unworthy of him.   It is known to almost every
one that the plan of the museum was formed by John Hunter; and that
by far the larger number of specimens were collected and prepared by
himself.   We have noticed in a former volume (vol. IV. pp. 83-6) the
untiring zeal and the disregard of all considerations of self-interest, which
carried him forwards in the prosecution of his vast work, that of building
up the science of physiology on the sure foundation of comparative ana-
tomy.   This he regarded as the great object of his life; and for this he
will ever be entitled to the tribute of admiring gratitude from all who
profit by his labours; and whom will not this expression include?   It
has been too much the fashion, even in this country, to refer to the school
of Cuvier as that in which the important truth was first broadly enun-
ciated, that no functional operation of any living being can be completely
understood, until it has been compared with the corresponding operations
of all others.   And this belief has been prevalent, not only among the
large class who are satisfied with a general notion of the matter, but
among some who have professed to be really well acquainted with the
grounds of it.   True it is, that in successive Hunterian orations attempts
have been made to correct this misconception; but the statements therein
contained have been looked upon with a not unreasonable suspicion, as
panegyrics dictated by time, place, and circumstance, and uttered by ad-
miring and grateful pupils.   The work before us, however, will afford
convincing evidence to all who merely glance cursorily through its con-
tents, that we are right in claiming for Hunter the foremost place amongst
the modern *illuminati* of physiological science; and foremost, not merely
in point of time, but in the grandeur of his conceptions, and the scope
of his labours.   For, whilst the labours of the Cuvierian school have been
principally restricted to the study of animal structures, it is evident that
Hunter's mind already conceived the idea, which has recently proved so
fertile in important results, that the study of the structure and vital ac-
tions of plants is no less important as a foundation for those generaliza-
tions, which alone can raise physiology from the rank of a crude unar-
ranged collection of imperfectly-understood facts, to the level of a stable
and well-ordered science.   In proof of our assertion, we can now appeal

to the Hunterian Museum, a monument to the fame of its great founder,
which will outlive, we venture to predict, those works on which the fame
of Cuvier is founded.   For whilst the progress of knowledge is gradually
impairing the value of the " Règne Animal" as a key to classification,
and whilst new methods of research are shortening the laborious path by
which the great principles of the " ossemens fossiles" may be applied,
every addition to the Hunterian Museum tends but to render it a more
perfect representation of the design of its founder, and to afford new
materials for those laws of animated nature which it was his aim to dis-
cover.   It is not our present purpose to institute a formal comparison be-
tween the minds of these two illustrious men ; but we may briefly express
our opinion of their respective characters, in saying that, whilst to Cuvier
we would assign the highest *talent*, the brilliancy of that intuitive *genius*
which makes the great poet, the great artist, or the original discoverer,
is chiefly to be found in Hunter.   The discoveries of Cuvier were made
in the true spirit of inductive philosophy, by the collection of instances
and the generalization of particulars.   The *idea* of applying this philo-
sophy to the science of life, by extending the primary sources of inquiry,
from the few animals of not very dissimilar character to which appeal
had been previously made, to the whole range of the animal and vegetable
kingdoms, is unquestionably Hunter's ; and we have good reason to know
that Cuvier profited largely by it.

The Hunterian Museum was purchased by a Parliamentary grant of
£15,000, and was committed to the charge of the College of Surgeons, on
their undertaking its conservation, and also agreeing to prepare a cata-
logue of its contents, and to give every facility for the beneficial employ-
ment of them by the public.   Further grants, amounting to £27,500,
were afterwards made for the erection of a building for its reception ;
but the recent extension and reconstruction of this building has been ac-
complished by the funds of the College only, and reflects the highest
credit upon those under whose direction it has been effected.

That the College has nobly performed its promise of " preserving the
collection in the best possible state at their own expense," cannot be
questioned.   Not only has there been the most sedulous care to preserve,
with an almost religious veneration, every preparation which was left by
Hunter, but a very large number of important additions have been made
to the collection, not only by the donations of the scientific public, but
by the labours of the conservators, especially Mr. Clift and Mr. Owen.
In a large proportion of instances, these additions have been of the most
important and interesting character ; some being designed to fill up
lacunæ which Hunter had himself indicated, but which he had not the
opportunity of completing; and others being derived from various re-
markable animals which have been discovered since his death, such as
the ornithoryncus, echidna, dugong, squalus maximus, &c.

" The [physiological series of the Hunterian] collection includes 3745 speci-
mens of that kind which require the utmost skill and science in their preparation,
and the greatest care and expense in their preservation.   That Mr. Hunter,
however, regarded it but as an approximation to an adequate display of the
general plan which pervades organic nature, is to be inferred, from the earnest
assiduity with which, to the last day of his existence, he laboured towards its
perfection.   Some deficiencies he has himself noted, and occasionally has indi-

cated the animal in which would be found the intermediate gradation of structure necessary to complete a series. The additions, therefore, have been prepared in exact accordance with those indications, and always, it is hoped, in harmony with the founder's original design. As it is important to the history of physiology, and just to the memory of Mr. Hunter, to maintain the integrity of his collection, these additions are so marked, that they are at once readily distinguished from the Hunterian specimens, and the original condition and connexion of the latter left undisturbed." (Preface to vol. i. p. xi.)

By a separate index to these additions, which is appended to the last volume of the catalogue, we are enabled to estimate their number at about 706, exclusively of Mr. Swan's munificent donation of his series of preparations of the nervous system, which was not received until after the publication of that portion of the catalogue which embraces the nervous system. Of these additional preparations, 186 have been made by Mr. Clift, 220 by Mr. Owen, and 66 by Sir Everard Home. The subjects of forty-eight of them were liberally presented by the council of the Zoological Society, which has shown the greatest readiness to contribute to the perfecting of this splendid collection, at the expense of its own museum.

The utility of this collection to the public, however, has until recently been much less than the public had a right to expect, after having aided the College with grants amounting to £42,500, for the purpose of having it preserved in the most advantageous manner, and of having the necessary facilities afforded to those who desired to study it. No printed catalogue was issued ; and the visitor has been obliged to depend upon the information he might be fortunate enough to obtain from the conservators and their assistants, upon whose time and attention the demands were too numerous for any individual to expect much assistance. We cannot but deem the conduct of the council very blameworthy in this respect; but the neglect of the past has been amply redeemed by the recent completion of a catalogue which reflects the highest credit on all concerned in it, and which supplies all that could be desired or expected, whether to the student who seeks to become acquainted on the spot with the individual preparations, or to the physiologist who wishes either to take a general survey of the contents of the museum, or to be directed to the study of any particular department. We can scarcely speak more highly of this great work, than by saying that it is such a catalogue as Hunter himself could scarcely have surpassed, had he not been prevented from thus completing his grand design by his sudden death. The vast amount of knowledge requisite to construct such a catalogue, and the immense labour which must have been bestowed upon it, will be best understood, when we have given a sketch of the history of the work, founded upon the materials contained in the prefaces to the first and last volumes.

Before the formation of the present catalogue, the printed works from which information could be derived respecting the physiological collection, consisted of the published writings of Hunter, a brief synopsis of the contents of the Museum published in 1818, and the lectures on comparative anatomy of Sir E. Home. The latter profess to explain the Hunterian collection ; but they contain descriptions of a small number only of the preparations, and these descriptions are unaccompanied by any re-

ference to the particular specimens. The synopsis is a mere table of
contents, which was in many instances arranged upon false principles,
and exhibited but a very imperfect knowledge of the true relations of dif-
ferent organs to each other. This synopsis has consequently been widely
departed from in the present arrangement; the alterations, however, con-
sist for the most part of a return to Hunter's original arrangement, and
have been either suggested by the Hunterian manuscript catalogues, or
made with the view of obtaining greater simplicity and consistency, and a
more regular subordination in the several groups of preparations.

The catalogues descriptive of the original preparations have hitherto
existed only in manuscript. The very imperfect materials which they
have afforded for the identification of the specimens will be obvious from
the following enumeration of them:—1. A manuscript catalogue in
Hunter's handwriting, without date, but probably written soon after his
return from Portugal in 1763. It briefly defines the nature of about 200
specimens; of which part were of a physiological and pathological cha-
racter, and part zoological; the latter having been for the most part col-
lected in Portugal, Spain, and Belleisle, during his service as an army-
surgeon. This collection was the germ of the future Hunterian Museum,
and the foundation of its several departments.—2. A small octavo manu-
script without date, in the handwriting of Mr. W. Bell and of others who
assisted Hunter; this describes or notices 561 of the physiological pre-
parations.—3. The quarto catalogue, which is the most valuable of the
original Hunterian documents relating to the present department of the
collection. It consists of twenty thin fasciculi, respectively devoted to
the several classes of organs described; and it is in the hand-writing of
Mr. W. Bell and others, with additions and corrections written by Hunter
himself. Most of the fasciculi commences with general observations on
the series of organs to which they respectively relate; and these valuable
expositions have been introduced, with a few verbal corrections merely,
in their appropriate places in the present catalogue. Still the chief im-
portance of this catalogue consists in the information which it supplies
respecting the scheme of arrangement, and the general physiological
principles intended to be illustrated by the different series. The de-
scriptions of the individual preparations are comparatively few; and these,
for the most part, are confined to a brief definition of the object. Many
had merely the name of the animal or part written on the top of the
bottle; and the rest were without either name or number.—4. From
these materials, Dr. Baillie, Sir Everard (then Mr.) Home, and Mr.
Clift commenced, in the year 1793, the formation of the folio catalogue,
which served for the use of visitors until the publication of the present
one.—5. The collection having been rearranged and renumbered by
Mr. Clift, under the direction of Sir E. Home, in 1817, a new catalogue
was commenced by the former gentleman, which included, with the
original memoranda attached to the specimens, some notes of his own
as to their history. This document has proved of material use in the
determination of many of the unnamed specimens; but it is only of very
limited extent.—6. Another document of much importance in the iden-
tification of the individual specimens, is a catalogue by Hunter of a
series of drawings chiefly taken from preparations in the museum, and
intended to illustrate their description. About thirty specimens, in some

instances of complicated and minute structures, have been determined by this mode of comparison.

In the present catalogue, the original Hunterian descriptions have been retained, as far as possible ; additions have been made to them when they were found to be not sufficiently clear; and new descriptions have been given of all the remaining preparations.   The information most commonly required in addition to the previous descriptions and notices, has been the name of the species of plant or animal from which the preparation had been derived.   Where this information is attempted in the manuscript catalogues, it is commonly of a very imperfect nature, such as " a monkey," " a whale," " a beetle," or " a snail ;" or the indication is still more vague, as " an insect," a " sea-worm," " a shell-fish," &c. In a great proportion of the specimens, the description relates only to the organ, or ends with " animal unknown."   Hunter cannot be justly blamed for the want of this kind of information ; since many of the animals he dissected were unknown to naturalists at that period, and consequently were without cognizable or scientific denominations.   In many cases, where the species is more definitely indicated, rectification of the name has been found necessary ; and this has been effected in some instances by a comparison of the preparation with such descriptions and figures of the anatomy of the animal from which it was supposed to be taken, as could be found in print; and in other instances by actual dissection of the animal.   The former mode of identification, even in the more entire specimens of dissected animals, is necessarily very limited; since in general the preparations are more or less mutilated in parts of the body from which the zoological characters are derived, so that a satisfactory identification from books is sometimes entirely precluded. The assistance derivable from the same source, in ascertaining the species to which the unnamed specimens of detached organs belong, is still more casual and uncertain ; so that in their elucidation it was necessary to consult the book of nature.   More than two hundred dissections have been made with this view, especially of such animals as, from any indication in the manuscripts, appeared to have afforded a doubtful specimen ; and many which were before unknown have been in this way identified. At first, the means of instituting these comparisons were few, and depended on the casual acquisition of animals from uncertain sources.   But since the institution of the Zoological Society of London, a more ample scope for the investigation of comparative anatomy has been opened ; and the materials for these progressive inquiries have been afforded with the greatest liberality.

From these statements some idea may be formed of the skill and labour required to bring this great work to its present high state of perfection. The Council have most laudably determined that it shall be brought before the the public in a manner every way worthy of its great authors, John Hunter and Richard Owen ; and the volumes are not only distinguished for the typographical elegance and accuracy which characterize the works that issue from the press of their learned printer, but are adorned with a series of most beautiful engravings of some of the most perfect anatomical drawings which it has ever befallen us to see. With the exception of two, from the pencil of Mr. Owen, illustrative of the anatomy of the nautilus, and six illustrating the comparative anatomy

of the organ of hearing, which were presented to the College by Sir A. Carlisle, the whole series, seventy-eight in number, are engraved from the original drawings of William Bell and J. Van Rymsdyk, two artists whom Hunter kept in his service for several years. The drawings of the former are remarkable alike for their artistic merit, and for their anatomical precision. It is evident that he well understood the structures he was delineating, and looked upon them with the eye of an anatomist, as well as that of a draughtsman. We cannot conceive anything more beautiful than his representation of the anatomy of Holothuria, (plate iii. vol. i,) to which ample justice has been done by the engraver, Mr. Basire; or than the series illustrating the development of the egg, which is contained in the last volume. Of many others, by the same artist, the subjects afford less scope for the display of talent; but all are treated with like skill. The drawings of Van Rymsdyk are perhaps superior in force and boldness, but appear to us less perfectly finished than those of his coadjutor. We shall presently return to the subjects of some of these delineations, which present topics of peculiar interest.

We must not conclude our general notice of this work, without adverting to the elaborate double index at its close. There is first an anatomical index, in which the subjects are classed in the same manner as in the body of the work, i. e. according to their physiological character; this is, therefore, rather a very detailed table of contents. Under every subdivision are given references to the numbers of the preparations which illustrate it, and to the volume and page of the catalogue in which these are described. By this the physiologist will be able to ascertain at a glance the materials which he will find in this museum for the elucidation of any particular department of his inquiries. The other index is constructed upon a zoological arrangement; so that by a reference to the name of any species (which will be easily found by turning to its class and order) the comparative anatomist is informed of all the preparations which illustrate the details of its structure. The preparation of this index must have been a work of immense labour; but we feel sure that its compiler will be amply repaid by the increased facility which is thus afforded in the consultation both of the preparations themselves, and of this descriptive Catalogue of them. This index further affords some interesting information respecting the large number of species from which the materials of this noble collection have been derived. As might be expected, a considerable proportion of the preparations have been made from the bodies of the larger and more accessible animals; but, in each of the higher groups, we find that one species at least has been submitted to detailed analysis; so that a very complete series of the chief types of structure is presented to us for every organ. Of course man stands at the head, in point of the number of preparations derived from his body, as well as in zoological arrangement. Several preparations of the chimpanzee and orang-utan, which were rare animals in Hunter's time, have been added by Mr. Owen. The hedge-hog and the mole, among the Insectivora,—the lion, cat, dog, and seal, among the Carnivora, —the porpoise, dolphin, bottle-head, piked and whalebone whales among Cetacea,—the elephant, horse, and pig, among the Pachydermata,—the camel, fallow-deer, sheep, and ox, among Ruminantia,—the rat, beaver, porcupine, and rabbit, among Rodentia,—the opossum and kangaroo

among the Marsupialia,—furnished Hunter with a large number of his specimens.   To these we may add the ornithorhyncus, an animal unknown to Hunter, whose extraordinary structure has been displayed in a series of seventeen preparations made by Messrs. Clift and Owen.   Yet the total number of species among the Mammalia alone, exceeds 150. In the class of Birds, again, the owl, sparrow, cuckoo, fowl, ostrich and goose, furnish a large quota ; but the total number of species that have furnished preparations is 70.   Among Reptiles, we find the turtle, crocodile, guana, chameleon, rattle-snake, boa, frog, and siren, particularly illustrated ; whilst the total number of species included exceeds 70. Among Fishes, the species whose structure is most completely displayed by Hunter, are the gray shark, dog-fish, skate, electric ray, sturgeon, mackerel, cod, conger eel, electric eel, and lamprey ; to these may be added the great basking shark, of which numerous interesting preparations have been made by Mr. Clift.   The total number of species of fishes, of which preparations are included in the museum is nearly 80.   It will be evident to any one in the least conversant with zoological arrangement, that better types of the several groups could scarcely have been selected, than those which circumstances threw in Hunter's way.   But so far from being satisfied with these, he used every exertion and spared no expense, to obtain specimens of the rarest and most curious animals ; and the value of the collection to the naturalist, as well as to the comparative anatomist and physiologist, is thus immeasurably increased.

Until we had consulted this zoological index, we had ourselves no idea of the extent of Hunter's labours in the anatomy of the invertebrata.   It must be borne in mind that, at the period when he was engaged in prosecuting them, there was little or nothing known with respect to the principles of their classification, and this was a consequence of the absolute deficiency of any satisfactory information as to the leading types of structure which prevail among the residents in this vast province of the animal kingdom.   Thus, in the system of Linnæus, which was the only one at that time in general use, all the invertebrata which present an evidently articulated structure, such as true insects, crustacea, arachnida, and myriapoda, are grouped together as insecta, whilst all in which this structure is not obvious, are associated together as vermes.   It is impossible to imagine anything more heterogeneous than this last group, for it brought together in close proximity many really vermiform animals that belong to the articulated series, the whole sub-kingdom of the mollusca, all the radiata, and even some of the lowest fishes in which the vertebrated structure is indistinct.   To Cuvier is usually assigned, and not unjustly, the merit of first breaking up this group into its proper divisions ; and of showing that the articulated, molluscous, and radiated types of structure are equal in rank to the vertebrated ; so that the animal kingdom must be primarily divided into these four sub-kingdoms. Yet we think that the evidence we possess in the museum and fragmentary works of Hunter, is quite sufficient to show that he perceived the necessity of an entirely new system, that he was diligently collecting materials from which to construct it, and that so extensive and accurate were his researches, he could scarcely have failed to strike upon the true principles, had his life been prolonged sufficiently to give to the world the generalized results of his wonderful labours.   Of this there is evi-

dence in his arrangement of his preparations of the "nervous system;" in which he distinctly points out those entirely different types of structure, characteristic of the mollusca and articulata respectively, of which so important a use is made in the "Règne animal" of Cuvier. Indeed we are in possession of evidence from a private source, that the Hunterian Museum was made the object of particular study by Cuvier, previously to the publication of the first edition of the "Règne animal." Yet with that jealousy that too often shows itself among our Gallic neighbours, Cuvier never spoke of Hunter but as a second or third rate anatomist, classing him with or even below Camper and Vicq D'Azyr; and referred to him only as the author of a treatise on the teeth, and some papers in the Philosophical Transactions. Yet that Hunter had long anticipated Cuvier in many of his most interesting observations upon invertebrated animals, the preparations and drawings he has left afford ample evidence. Thus the anatomy of several of the tunicated mollusca had been investigated by him in a way which leaves but little to desire; he had thoroughly examined the solen, sepia, and many gasteropods; and has left the most elaborate dissections and figures of the cirrhipeds; in all which he was but followed by Cuvier in those "Mémoires sur les Mollusques," on which his reputation as an original inquirer greatly depends. The figure which Hunter has left of the circulation in the chlœia capillata, a red-blooded worm, far surpasses in beauty and detail any of those with which Cuvier illustrates the memoir dedicated to what he regarded with his latest breath as one of his most interesting discoveries. The illustrations of the anatomy of the echinodermata have not, until the recent monograph of Valentin upon the echinus, been surpassed either as to minuteness or accuracy; and, excepting in the disputed article of the nervous system, little is added in the elaborate and well-known monograph of Tiedemann, to the anatomy of the Holothuria, as it is displayed by Hunter. The total number of species of invertebrated animals of which the museum now contains preparations exceeds 300; and although part of these have been more recently added, the number of species dissected by Hunter himself could not have been far short of 200. We have no hesitation in saying that this number exceeds that which could have been furnished by the united labours of all the other anatomists of that or preceding periods.

We shall now present our readers with a cursory sketch of the arrangement of the Museum, and with a few selections from the Descriptive Catalogue, which will afford a fair sample of the plan of the work, and of the information that may be derived from it, even by those whose opportunities of consulting the great original are few and far between.

The series of Preparations is disposed in two divisions; first, those illustrative of the functions which minister to the necessities of the individual; and secondly, those which provide for the continuance of the species. The First Division commences with a few examples of the component structures of organic bodies; and then extends into a series embracing the active and passive apparatus for progressive motion. This series begins with specimens of the chief examples of Motion in Vegetables—the mimosa, dionœa, hedysarum, and erythrina; and in regard to the analogy between these and muscular movements of animals, it is evident that Hunter possessed ideas not far from the truth. The structure of Muscle

is the next subject embraced in this series; and among the preparations illustrative of it is one whose curious history is well known to professed physiologists, but which we shall quote as it may be new to many of our readers:

"34. The biceps flexor cubiti muscles from the arms of a Negro. That of the right side is in its natural state; the other shortened one-half of its length, in consequence of the os humeri of that arm having been fractured obliquely, and having become united with the fractured ends of the bone riding on one another. After the union of the bone, the biceps (together with the other muscles of the arm) became shortened by the interstitial absorption, so as to correspond with the diminished length of the bone, and the arm regained its natural action." (Vol. i. p. 9.)

The history of the case may be found at greater length in Sir E. Home's Lectures on Comparative Anatomy; in which it is mentioned that, on the man's death occurring some years after the accident, the biceps muscles of both arms were carefully dissected out, and being measured, the one was found to be eleven inches long, the other only five, so that the muscle of the fractured arm had lost six inches. Scarcely a more beautiful instance could be adduced of that tendency to the advantageous reparation of injuries with which the animal body is endowed,—a tendency conveniently referred by some to the exertions of an ill-defined semi-intelligent principle, *vis medicatrix naturæ,* but in reality only one result of those laws of nutrition by which the fabric is continually preserved in spite of the waste it is as constantly undergoing.

After the series illustrative of muscular structure and action, we find another exhibiting the application of Elastic Structures—either as antagonists to muscles, as in bivalve shells, or as aiding muscular action, as in the ligaments of the spinal column of vertebrata. Following this is a short series exhibiting the different substances of which the Skeleton is composed; and then commences the series of hard structures which serve as passive instruments of locomotion. Of the first part of this, embracing the calcareous fabrics of zoophytes, mollusca, and crustacea, under the general term Shell, a comparatively small number of the preparations were the work of Hunter himself; many of them were presented by Mr. Hatchett, whose memoir on the subject in the Philosophical Transactions of 1799, (from which extracts illustrative of the preparations are included in the Catalogue,) is still of standard authority; and many have been more recently added. The next division illustrates the structure and growth of Bone; and among these we find the two following experimental results, which are peculiarly worthy of notice:

"188. The left tarsus of the domestic fowl, upon which the following experiment was performed. Two small holes where made by cauterization near the extremities of the bone; the length of the bone at that time being two inches aud ten lines, and the distance between the holes one inch and eight lines. After a certain period the animal was killed, and the length of the bone was found to be three inches seven lines, while the space between the apertures was one inch and eleven lines; the increase of the bone beyond the points of cauterization being more than double that of the space included between them.

"189. The right tarsus of the domestic fowl, longitudinally bisected, to show the results of the following experiment. When the animal was young, the bone was perforated near each extremity, and a small leaden shot was introduced into each hole. After a certain period the animal was killed, and the length of

the bone was found to have increased to three inches and ten lines; but the distance between the shots which had now reached the medullary cavity was exactly the same as when first introduced." (Vol. i. p. 41.)

Upon these experiments Hunter founded the statement contained in his Lectures on Surgery, that " a bone does not grow in all its parts ; that is, it does not grow by addition of new particles among those already arranged, or in their interstices, but by the addition of parts lengthways or sideways of the bone ;" a statement which, if not absolutely true, is certainly not very far wrong.   Late researches upon the structures of the hard parts of the invertebrata have shown that they too are organized, and that they differ chiefly from bone in the absence or imperfect possession of that vascular network which in the latter lines the Haversian canals, but does not pass into the actual substance of the bone.   Many other interesting preparations, which we cannot stop to notice, are contained in this series.

The next principal series is a very interesting one illustrative of the composition of the skeleton, with reference to its articulations, and to the admixture of osseous, cartilaginous, and ligamentous structures.   In this are contained some of those preparations on which were founded Dr. William Hunter's accurate descriptions of the structure of articulate cartilage ; he was, we believe, the first to notice the continuity of the synovial capsule over the surface of the cartilage, thus demonstrating it to be a shut sac like the serous membranes ; and he also noticed, under the name of *Circulus articuli vasculosus*, the peculiar anastomotic disposition of vessels around the margin of the joint, which has been recently described by Mr. Toynbee.   Following this series is one illustrating the " mechanical contrivances by which the powers of the muscles are augmented ;" and another comprehending " the various organs for progressive motion."   In the latter are some interesting preparations, added by Mr. Owen, which illustrate the mechanism of the movements of serpents, which use the free extremities of their ribs in crawling along the ground, very much in the same manner as the centipede uses its legs. The proper muscles of the spine, being so largely concerned in the movements of these animals, attain a very high degree of development.   Distinct analogies may be recognized between their several groups, and the spinales and semispinales dorsi, the longissimus dorsi, the sacrolumbalis, the multifidus spinæ, and the interspinales and intertransversales of man. External to the multifidus spinæ is a series of short and strong oblique muscles, which, like the levatores costarum, arise from the transverse processes, and are respectively inserted into the rib attached to the succeeding vertebra.   Where these are inserted, longer muscles, *prætrahentes costarum*, arise, which run more obliquely backwards, each of which terminates in the eighth rib beyond that from which it arose, but is also inserted into all the intermediate ribs, and is closely connected with the intercostales.   The muscles on the inferior surface of the spine are peculiarly developed ; they arise from the transverse processes, and converge forwards to be inserted into the inferior spinous processes of the vertebræ. External to these are situated the *retrahentes costarum*, which arise from the lower part of the transverse processes ; and after passing obliquely forward over three ribs, are respectively inserted into the fourth.   Beneath these, there is a stratum of short muscles, which arise respectively

from the head of one rib, and run obliquely backwards to be inserted into the next rib; and there is another series, analogous to those which Winslow has termed sub-costales in the human subject, which form a kind of continuation of the retrahentes, arising where they terminate, and passing on to be inserted into the second rib beyond. The *retrahentes* and their assistants are manifestly intended to advance the spinal column by drawing back the ribs when their points are resting on the ground, whilst the *prætrahentes* bring the ribs again forwards when the body is at rest.

The second subdivision embraces the Organs of Digestion; and at the head of these are placed the preparations illustrating the structure and growth of Teeth. This position, which we regard as peculiarly appropriate to them in a physiological arrangement, was assigned to them by Mr. Clift. In the time of Hunter, when the teeth were usually enumerated by anatomists among the bones of the skeleton, probably no other physiologist would have thought of classifying them, as he did, with hairs and horns. Some of their striking relations to the extra-vascular productions, thus early appreciated by him, have been subsequently insisted on by other philosophical anatomists, to the exclusion of the facts and arguments which are still valid for regarding them as appendages to the osseous system. Sir E. Home removed the series in 1818, to a place between the "stomachs" and "intestines," a most absurd position. The present locality is peculiarly appropriate, as in harmony with the structural relation of teeth to bone, and with their physiological action in the economy. The series commences with a very interesting collection of parts analogous to teeth, including the various structures answering the same purposes in invertebrate animals, together with the bills of birds, and whalebone: of this last substance there are several interesting preparations; and illustrative extracts are introduced into the Catalogue from Hunter's paper on the structure and economy of whales, in the Philosophical Transactions. The series of teeth proper is very extensive, illustrating their formation, component parts, shedding, and situation. At the commencement of the series illustrating the structure of the Stomach are some very interesting original observations of Hunter's, which show that he had long anticipated in idea the celebrated French definition "*Un animal est un estomac servi par des organes.*"

"The apparatus necessary for the simple operation of digestion is as simple as anything we can well conceive. It only requires a bag or cavity fit to contain the substance to be digested, joined with the power of furnishing the fluid capable of digesting or animalizing the said substance. In such a light it is only to be considered as a gland with a cavity. But it was necessary that there should be some part added to furnish this bag with materials to be digested; for which purpose there are in some arms, in others both arms and teeth, &c. Besides the simplicity of the apparatus for the operation of digesting, there is another apparatus added to fulfil the intention, which is the system for absorbing the animalized parts for the nourishment of the same bag; and added to this power of secretion and absorption is the power of throwing out of the bag the indigestible parts, acting as a kind of secretory duct. Nothing more is necessary to complete an animal than the power of continuing the species, which power is superadded to this bag in many. From this account nothing can be more simple; however, it completes a whole animal; and nothing more can be necessary for the support of such an animal; but when we

come to such stomachs as have parts superadded for other purposes than the above, then we find that this same apparatus for digestion has also parts superadded for the purpose of digesting; so that the parts preparatory and subservient to digestion become more complicated, and indeed so much so that there is hardly any system in an animal more complicated in itself; and when we consider the varieties of these complications which take place in the various animals, they appear to be almost without end. It is these complications and varieties that we mean to consider, and reduce, as far as they will admit, to their several classes." (Vol. i. pp. 112-3.)

We do not admit this statement in its full force; since we think it would be easy to prove that the essential characteristic of an animal is its possession of consciousness and voluntary power; the instrument of which faculties is a nervous system; and, that the presence of a stomach and its appendages is necessarily connected with the peculiar conditions of animal existence, such as the power of locomotion, and the nature and sources of the food. But the beauty and truth of Hunter's views, considered with reference to the digestive system only, must be apparent to all; and of their novelty at that time we do not think there can be the least doubt. No previous anatomist, we feel sure, had succeeded in bringing together so extensive a series of preparations illustrating the various forms of the digestive apparatus, from the simple sac of the hydatid or polype, to the complex intestinal canal of the higher vertebrata; and no one, therefore, could have possessed such clear views of the true relations and analogies between parts apparently different, as those at which Hunter had arrived. We cannot stop to notice any of the very numerous interesting preparations contained in this series, except No. 523. " The stomach of a sea-gull, which had been brought to feed on barley, showing that the muscular parietes of the gizzard were become much thicker in consequence." The history of this preparation is given in Sir E. Home's Lectures; and from it we learn that the bird had been kept by Hunter for a year. It is to be remembered, however, that the gull and many birds of its order are naturally to a certain extent omnivorous, being destined to act as the scavengers of the sea-shore, as well as to feed on living fish; and that an alteration in its natural habits might be allowed by the adaptive power of its structure, which might not be as well borne by more purely carnivorous birds. We learn from Hunter's observations on digestion, that he gradually brought a kite to feed on bread alone; but the affinity of this article to flesh is too close, both in respect to its composition and consistence, for the experiment to be a satisfactory one; and we doubt if any raptorial bird could be brought to feed on grain alone.

Upwards of 450 preparations are contained in the series of digestive organs, exclusively of those of the teeth; and the account of these occupies the whole remainder of the first volume, except the part devoted to the descriptions of the plates. Of these, the first two include figures taken from preparations of bones of the hog, in a growing state, coloured with madder, and forming part of the series preserved in the collection to illustrate Hunter's theory of the growth of bone. They are very interesting as memorials of the original appearance of these preparations, the colours of which have now faded. Plate iii. is from the beautiful drawing of the holothuria to which we have already alluded; and it is accompanied by the full original description which has been fortunately

preserved to us. The following introductory observations show how much of the philosophy of comparative anatomy was in Hunter's mind, although often obscurely expressed:

" Perhaps there is nothing so difficult in natural history, as the finding out the uses of the different parts of animals when they differ widely from those we are best acquainted with, especially so in those whose economy we can hardly observe. If the regular gradations from one species or genus of animal into that of another was well ascertained, we could most probably assign the uses to each part from analogy ; but as that gradation is not yet known, and as we often are examining animals that seem in many of their parts to have no affinity to any animal we know, for what answers any one purpose in the animal economy and may exist in most animals, yet shall so vary in its form as not to give the least idea of its use,—therefore we are left to conjecture about their uses in such animals. The priapism is an instance of the above observation ; many parts can be made out ; but the uses of many must be left to conjecture till the analogy is made out complete." (Vol. i. p. 251.)

In this as in many other cases, it is evident that Hunter was well aware of the essential character of a gland, as since described by Müller ; for he correctly refers to the " appendicula cæca which surround the mouth and fauces and enter their cavity," as " salivary glands and ducts."

In the succeeding plates are almost equally beautiful delineations of the structure of the Barnacle, (which has been since described in the splendid work of Poli, who attended Hunter's lectures and enjoyed his friendship whilst resident in London,—as well as by Cuvier,) and also of the Ascidian Molluscs, the true nature and relations of which were well known to Hunter, who proposed to distinguish them as a distinct group under the name of " soft-shelled," which more truly accords with their real character than " shell-less," as they have been subsequently designated by Cuvier. Afterwards there follow five plates representing the digestive apparatus of birds, and that of the crocodile ; which last is observed by Hunter to bear a strong resemblance to that of birds in the disposition of the central tendon, and of the turns of the duodenum.

The second volume contains the Absorbent, Circulating, Respiratory, and Urinary Systems. The description of the preparations illustrating the first is prefaced by a full statement, in Hunter's own words, of his views respecting absorption; as these, however, are sufficiently well known through other channels, we need not stop to quote them. It is right that we should remark, however, that Hunter's doctrine—stated by himself in the following terms, " The arteries perform the different and immediate actions of the machine as before; the veins replace the blood for the repetition or continuance of these actions as before, but have now lost their power of absorbing; the absorbents exclusively perform those actions, a summary of which we have previously given,"—is undoubtedly too exclusive ; for the veins certainly take up many substances, both from the intestinal tube and the external surface ; and it may be questioned whether the lacteals are concerned in anything else than nutritive absorption, and whether the lymphatics have not for their function to absorb those products of the decomposition of the tissues which are to be re-introduced into the nutritive apparatus, rather than those which are destined for secretion, and which are pretty certainly returned by the veins. A long note is appended to these preliminary observations, claiming for Dr. W. Hunter the discovery of the true

origin, course, and functions of the lymphatic system, which had been attributed by some of his detractors to Noquez, whose ideas on the subject were evidently very imperfect.

The series of the Circulating System commences with those which exhibit the circulation in vessels without a heart, evidently the true way of showing that the movement of blood through capillaries does not depend upon *vis a tergo* alone.   In this division is the preparation from which is taken Mr. W. Bell's very beautiful drawing of the vascular system of the amphinome, one of the marine annelida ; although no description of this drawing was left by Hunter, yet it is evident that he must have thoroughly understood the course of the circulation, so beautifully is the whole system of vessels displayed.   The portion of the series illustrating the various types of the heart's structure is most beautiful and complete ; many rare preparations have been added within a recent period ; and the descriptions of all the more important ones are sufficiently complete to serve as valuable data to the student of comparative anatomy.   This is especially the case with regard to the hearts of reptiles, which exhibit so interesting a transition from the single to the duplex apparatus of circulation.   The anatomy of the siren, in which the respiratory apparatus is double during the whole of life, had received from Hunter a large share of attention; and several preparations of the heart and large vessels are contained in his museum.   By Hunter it was believed that the heart in this group possesses only one auricle ; and in this error he has been followed by subsequent anatomists, not excepting Cuvier.   It has been corrected, however, by Mr. Owen, who has proved that the pulmonary and systemic veins open into distinct auricles.   The origin of the mistake appears to have been the fact, that the left or pulmonary auricle is very small ; and that the pulmonary veins in reaching it unite into a common trunk, which seems to pass through the great sinus of the veins of the body, but really adheres to the parietes of that sinus by its posterior surface.   This remarkable structure led Hunter to suppose that the sinus was part of the pericardium; and that the venæ cavæ opened into it.

In his general remarks upon the Respiratory System, Hunter embodies all those general ideas which were afterwards put forth by Cuvier in his introduction to the Règne Animal, and of which the latter has received the full credit.   They display so completely the extent of Hunter's inquiries, and his power of philosophic generalization, that we shall quote them almost in full.   The truths they contain are at present familiar to every tyro in physiology ; but this was far from being the case fifty years ago :

" Every part of an animal so exposed to the air as for the blood to be affected by it in such a manner as to support life, may be called Lungs, or Respiratory Organ ; but what is commonly understood as such is an apparatus formed for that purpose, as a distinct part of the animal.   But I conceive it very probable that there are animals so simple in their construction, as not to require a peculiar structure for this purpose.   I even know there are many so constructed, where an apparatus of this kind could not be applied, such an apparatus not according with the other parts.   Yet I do conceive that in such the application of air is as necessary as in those where an apparatus is found ; but where there is a distinct respiratory apparatus, there must be other corresponding apparatuses.   Where there is such an apparatus, we find it admits of forms fitted for the different modes of respiration ; yet all are included in the terms *branchiæ*

or gills, and *pulmones* or lungs. But there should be a generic term, admitting of divisions into species, so as to be characteristic of the orders of animals to which they belong. Without a collecting and a motion of the nutritive juices, I can conceive there can be no respiratory organ; for I find that the different circulations in the different orders of animals, as far as I know, are so connected with different kinds of lungs, as for either system not to be intelligible alone. In animals, where there is no circulation, there can be no lungs; for lungs are an apparatus for the air and blood to meet, and can only accord with motion of blood in vessels. But where there is no circulation, yet we must suppose, from analogy, that the air affects the juices that are to carry a continuance of life and support to all parts of the body. In the most simple animals, and such as breathe water, the whole apparatus is to have a considerable quantity of very vascular surface brought in contact with the medium in which the animal lives. In the air-breathing orders above fish, there is a simple bag, very vascular, for the reception of air, and this is divided and subdivided as we proceed towards the more perfect animals, till at last the cells are infinitely small. The lungs may be considered, respecting their blood-vessels or circulation, as similar to a gland; for the blood sent to them is not for their own proper use entirely, and indeed only a very small portion of it is for their own use, the larger portion being intended as a secretion from them, as also to receive." (Vol. ii. pp. 66-8.)

The following descriptions we select as good examples of this series, and as probably new to most of our readers:

"1029. The anterior part of a lamprey, showing the seven branchial apertures of both sides, and the corresponding gills of the left side partially exposed. When the lamprey is firmly attached, as is commonly the case, to foreign bodies by means of its suctorial mouth, it is obvious that no water can pass by that aperture from the pharynx to the gills; it is, therefore, alternately received and expelled by the external apertures. If a lamprey, while so attached to the side of a vessel, be held with one series of apertures out of the water, the respiratory currents are seen to enter by the submerged orifices, and, after traversing the corresponding sacs and the pharynx, to pass through the opposite branchiæ, and to be forcibly ejected therefrom by the exposed orifices. The same mode of respiration must take place in the myxine, while its head is buried in the flesh of its prey. The cyclostomous fishes thus present an obvious affinity to the cephalopods, inasmuch as the branchial currents are independent of the actions of the parts concerned in deglutition." (Vol. ii. p. 80.)

"1035. A longitudinal section of the anterior part of the body of a conger eel, showing the branchial cavity and gills, which are minutely injected. The water which is admitted by the mouth passes through five oblique apertures into the branchial cavity, and is forcibly driven by the simultaneous action of the branchial arches and operculum through the interspaces of the gills, and escapes by a single outlet, as in all osseous fishes. This outlet in the conger and other eels is a small vertical fissure, situated at some distance behind the gills; the branchial cavity is therefore proportionately elongated, and the escape of fluid from it is consequently impeded. As the branchial laminæ are thus kept apart and supported by the contained fluid, which insinuates itself everywhere between them, the circulation goes on in them uninterruptedly when the fish is out of the water; and as fresh air is probably absorbed from the surrounding atmosphere, as that which was originally mixed with the water becomes deteriorated by the respiratory process, the fish is enabled by this modification of the branchial apparatus to remain out of its natural element for a considerable length of time." (p. 82.)

The series of preparations of the urinary apparatus is peculiarly extensive and complete. Many of the most interesting of these were made by Hunter at a very early period, being noticed in his first manuscript cata-

logue. The introductory observations exhibit his full acquaintance with this important branch of comparative anatomy, and his account of the very first preparation shows his remarkable perception of the real analogies of doubtful organs:

" 1176. The soft parts of a snail, injected and prepared to show the gland in the respiratory cavity which surrounds the pericardium; the duct may be observed to run along the convex side of the rectum. The following is the description of this preparation in the original manuscript catalogue: ' A snail; shell taken off; air-bag opened; membrane exposed, covering part of viscera and genitals, some coils of which are seen through it; on the right is the last gut, as if a continuation of the spiral turns; and in the semicircular direction is the duct of that gland, running in the doubling of the air-bag. This, I believe, is kidney; its mucus is like that of birds; its opening is near the anus, and accompanies the rectum.' The researches of Professor Jacobson have shown that the secretion of this gland contains urea." (Vol. ii. p. 115.)

The second volume contains seventeen plates, of which the first includes the beautiful drawing of the vessels of the amphinome already referred to, with other subjects illustrative of the first stages in the development of the vascular system. The next four represent the circulating apparatus in the lobster, which Hunter had very carefully examined, and which he described much more accurately than Messrs. Andouin and Milne Edwards have since done. From Hunter's figures and descriptions it appears that both the bloods from the general system, and that from the respiratory organs, are received into a large sinus or auricle surrounding the heart, into the cavity of which they pass by several orifices, and from which they are again propelled, so mixed, both to the general system and to the gills. The French naturalists asserted that the heart of the crustaceans is a true systemic one, receiving only the aerated or pure arterial blood from the branchial veins, which terminate by two orifices in the sides of the ventricle, and these they assert to be the only venous orifices of the heart. The accuracy of Hunter's description, however, is corroborated by the subsequent dissections of Lund and Straus-Durckheim; and it is demonstrated by a preparation made by Mr. Owen, (No. 898 A,) in which black bristles are passed transversely through the four venous orifices that give passage to the blood of the general system from the great sinus surrounding the ventricle, these orifices (represented by the French anatomists as mere depressions) being respectively guarded by two semilunar valves. The succeeding plates depict the circulating and respiratory apparatus of the solen, pearly nautilus (by Mr. Owen); cuttle-fish, menopoma (one of the perennibranchiate batrachia, aptly denominated *pneumobranchiata* by Hunter) whose position between the siren and the ordinary batrachia is exactly assigned, common fowl, ostrich, crocodile, porpoise, &c. In the description of the fauces of the crocodile, the mechanism is distinctly pointed out, by which the communication between the mouth and fauces is closed, and the apertures of the larynx and pharynx defended both against the insects and other parasitic animals, which gain admittance to the mouth from its being unprotected by lips, and also against the entry of water during the period when the crocodile holds submerged a living and struggling prey. The credit of the discovery of this peculiarity has usually been assigned to the French savans who accompanied Napoleon in his Egyptian expedition.

The third volume contains the Nervous System and Organs of Sense, and the Tegumentary System; thus completing the first division, that of " organs in plants or animals for the special purposes of the individual." There is also a series of " peculiarities," embracing many interesting preparations which could not be well disposed elsewhere. It is justly re marked by the editor, that

" There is perhaps no department of anatomy in which greater advances have been made since the time of Hunter, than in the nervous system; both as regards the knowledge of the details of the various modifications which it presents in the animal kingdom, and with respect to the determination of its functions. It could hardly be expected, therefore, that his observations on this system, or any of its parts, would be characterized by the same depth and completeness as are manifested in his writings and preparations relative to the structures in which he was more immediately interested, viz. those relating to the vital functions. Nevertheless, the following pages will show that he had at least obtained a glimpse of all the leading modifications of the sensitive apparatus, and had accurately traced the component parts of the brain through their singular metamorphoses in the highest classes of animals without losing sight of their true analogies; of which, indeed, had the present manuscript been published in the lifetime of the author, it would have contained the earliest enunciation." (Vol. iii. p. 1.)

We cannot stop to advert to all the passages which bear out this statement : but the following strikes us as among the most interesting. In Hunter's preliminary observations, there is a classification of animals founded upon the structure of their nervous system; and the first division embraces " the first class of animals that have organs of sense, and consequently have brains." The preparations which in the original MS. catalogue illustrate the condition of the nervous system characteristic of this " class" are derived exclusively from the molluscous sub-kingdom of Cuvier; whence it may be inferred that Hunter had a perception of that great natural division of the animal kingdom, more especially as his other " classes" are extremely well defined, and embrace all other animals, save the radiata, of the existence of a nervous system in which, Hunter does not seem to have been aware. The following is Hunter's description of the nervous centres in the gasteropod mollusca, (from which alone his preparations are derived;) its correctness will be evident to any one familiar with the subject.

" The brain in this class of animals is scarcely similar in any respect to that of the most perfect animals with which we are in general more acquainted. It consists of a pulpy substance, somewhat transparent, which is easily squeezed out when the brain is cut into. It appears in some, and perhaps in all the lower classes that have brains, in the shape of a ring, from the circumference of which arise the nerves as radii from a centre. Through this ring (in such) passes the œsophagus. I am apt to believe, however, that this ring is not wholly brain, but a union of two large lateral nerves, which unite under the œsophagus. This at least appears to be the case with the next class. It is not inclosed in hard parts, and is not defended from pressure or injuries more than any other internal part." (Vol. iii. p. 5.)

When speaking of the brain of fishes, Hunter remarks that the void space within the skull is filled with a cellular membrane, analogous to the tunica arachnoides; the accuracy of which account is now universally acknowledged. The purpose of this arrangement is evidently to give to the head the large size which it requires for dividing the water, and for the attachment of muscles, without incurring an undue accumulation of

ponderous matter about the brain. After describing the general characters of the brain of reptiles, he remarks: " Although the crocodile is classed with the amphibia, (of Linnæus,) and really comes nearer to that class than to any other that I know of, it has not all the same character, as has been observed. It comes nearer the bird than any of the other amphibia, and therefore is a degree higher. The brain, although it has the same parts, yet it has them closer connected, and the skull is more in contact with it." The justice of this observation is confirmed by the fact, that most modern naturalists have separated the crocodile from the ordinary saurians, and assigned to it a higher place.

Several highly interesting preparations have been added to this series by Mr. Owen and others. Amongst these we shall notice two, (Nos. 1302 A, and 1303 B,) which were specially referred to in Mr. Owen's recent Lectures on the Nervous System, as having an important bearing on the question of the respective functions of the ganglionic and non-ganglionic tracts in the articulata. It is well known that, in the estimation of Dr. Grant and Mr. Newport, the ganglionic tract is sensory, the non-ganglionic motor; whilst Dr. Carpenter has laboured to prove—by comparison of the nervous system of the articulata with that of mollusca, as well as by an examination of the phenomena presented by the former animals after a division of the ganglionic column,—that the ganglionic portion is the centre of reflex action, the non-ganglionic, the channel of sensori-volitional action of which the cerebral ganglia are the real centres. The following are Mr. Owen's remarks on this subject, as reported in the Medical Times, (June 25, 1842 :)

" We have before us two opposite conditions of a large and important part of the trunk of two nearly allied and similarly-organized crustacea. In one, the lobster, the post-abdomen is encased in a series of calcareous rings, forming a hard and insensible chain armour. But in the same degree as sensibility is lost the muscular power is increased ; a great proportion of the contractile fibre is concentrated in the tail of the lobster, which forms its most powerful and almost exclusive organ of swimming. In the pagurus (hermit-crab) on the other hand, the muscular system is almost abrogated in the long post-abdomen, for this in fact takes no share in the locomotive functions of the body. It is occupied by part of the alimentary canal, and by glandular organs ; the external integument has no part of its sensibility destroyed by the interposition of calcareous particles, but retains the necessary faculty of appreciating the smooth and unirritating condition of the interior surface of the deserted shell which it chooses for its abode ; nay more, minute acetabula are developed in groups upon this sensitive integument ; delicate ciliated processes are also attached to it, to which the eggs adhere in clusters, during their incubation in the female. The muscular system is reduced to a few minute fasciculi of fibres, regulating the action of the terminal claspers. If, as has been conjectured, the ganglionic enlargements of the abdominal cords monopolize the sensorial functions, and the non-ganglionic tracts the motor powers, we ought to have found no ganglia in the tail which is constructed for motion exclusively ; whilst in the tail which is almost as exclusively sensitive, the ganglia ought to have been large and numerous. The contrary, however, is the fact. Six well-developed ganglia distribute nerves to the muscular fibres of the lobster's tail; non-ganglionic columns supply the sensitive tail of the hermit crab, the only ganglion in which is the small terminal one, that seems to have been called into existence solely to regulate the actions of the muscles of the organ of adhesion. ..... Admitting from analogy that the supra-œsophageal ganglion is that in which true sensation and volition reside, then those nervous filaments, which are exclusively connected therewith, and some of which would seem to extend the whole length of the animal along the dorsal

aspect of the ganglionic columns, would form with their ganglionic centre the true sensori-volitional system; whilst any other ganglia superadded to the abdominal columns, with the nervous filaments terminating in or originating from them, would constitute the system for the automatic reception and reflection of stimuli. In these views I coincide with the ingenious physiologist Dr. Carpenter, and shall feel happy if their accuracy and soundness have received any additional proof from the facts of comparative anatomy, now for the first time, I believe, brought to bear upon this interesting problem."

Of the numerous interesting preparations contained in the series on the Organs of Sense, our space only permits us briefly to notice the one which remains as a record of Hunter's discovery of the distribution of branches of the fifth pair to the olfactory surfaces. This preparation (No. 1550) was made in 1754, and is probably the oldest in the museum. It is described and figured in the " Animal Economy," where its history is given; and the same paper contains many interesting suggestions as to the objects of the complete distribution of the nerves, some of which stimulated Sir Charles Bell (we have his own authority for stating) to his successful researches. The following are the ingenious remarks of Hunter, immediately connected with this subject:

" In this dissection I found several nerves, principally from the fifth pair, going to and lost upon the membrane of the nose; but suppose that those have nothing to do with the sense of smelling,—it being more than probable that what may be called organs of sense have particular nerves, whose mode of action is different from that of the nerves producing common sensation, and also different from one another,—and that the nerves on which the peculiar functions of each of the organs of sense depend are not supplied from different parts of the brain. The organ of sight has its peculiar nerve; so has that of hearing, and probably that of smelling likewise; and on the same principle we may suppose the organ of taste to have a peculiar nerve. Although these organs of sense may likewise have nerves from different parts of the brain, yet it is most probable such nerves are only for the common sensations of the part, and other purposes answered by nerves. Thus we find nerves from different origins going to the parts composing the organ of sight, which are not at all concerned in the immediate act of vision; it is also probable, although not so demonstrable, that the parts composing the ear have nerves belonging to them simply as a part of the body, and not as the organ of a particular sense; and if we carry this analogy to the nose, we shall find a nerve which we may call the peculiar nerve of that sense, and the other nerves of this part, derived from other origins, only conveying common sensation, and we may suppose only intended for the common actions of the part. This mode of reasoning is equally applicable to the organ of taste; and if the opinion of peculiar nerves going to particular organs of sense be well founded, then the reason is evident why the nose, as a part of our body, should have nerves in common with other parts, besides its peculiar nerves; and as the membrane of the nose is of considerable extent, and has a great deal of common sensation, we may suppose the nerves sent to this part for that purpose, will not be few in number. It is upon this principle the fifth pair of nerves may be supposed to supply the eye and nose in common with other parts." (Vol. iii. p. 96.)

How much sounder and more philosophical is such reasoning, than that by which Magendie erected upon his ill-devised and ill-observed experiments the absurd dogma that the fifth pair is the real nerve of smell.

We believe that to Hunter is really due the first discovery of the organ of hearing in fishes, which he states himself to have demonstrated some time before he quitted his anatomical pursuits on going with the army to Belleisle, in 1760. It appears that scientific piracy was not uncommon even in those unenlightened days. " As in this age of in-

vestigation," says Hunter, " a hint that such an organ existed would be sufficient to excite a spirit of conjecture or inquiry, I was aware that there would not be wanting some men who, whether they only imagined the fact might be true, or really found it to be so, would be very ready to assume all the merit of the discovery to themselves." The following observation fully demonstrates his philosophical perception of the great law of unity of plan, to which all the various modifications of organs are referrible; although it is nowhere else perhaps so distinctly enunciated, yet in many other places there is obvious indication that Hunter was equally cognizant of its application to all departments of comparative anatomy : " I am still inclined to consider whatever is uncommon in the structure of this organ in fishes, as only a link in the chain of varieties displayed in its formation in different animals, descending from the most perfect to the most imperfect, in a regular progression."

We cannot stop to notice any of the interesting preparations in the series of " tegumentary organs" or of " peculiarities;" and we can only add with respect to this third volume, that it contains eighteen plates illustrating some of the most interesting subjects in it.

The two remaining volumes are appropriated to the second division; and include, therefore, a description of the preparations illustrating the Reproductive Function. From the large number of these preparations contained in the museum, it is evident that Hunter had given special attention to the subject; and his preliminary observations to the first subdivision, which contains the organs of generation, afford a masterly though brief exposition of the different modes in which this function is performed. We have already so nearly approached our limits, however, that we must pass by the fourth volume with this brief notice, merely stating that the descriptions it contains are not less interesting than the preceding, nor the preparations themselves less worthy of study. In fact they furnish a suite in itself almost complete enough to serve as the foundation for a full account of the comparative anatomy and physiology of the generative system. We must not omit to add that the volume contains eighteen plates, one of which gives another beautiful representation of the holothuria; whilst several others depict, not less elaborately, the female generative organs of fishes, the many curious types of which afford such interesting objects of study to the philosophic anatomist.

The fifth and last volume contains the second subdivision of the series on Reproduction; which relates to the products of the generative organs, and to the accessory structures and secretions of the parent, which are essential or auxiliary to the development and growth of the offspring prior to its acquisition of independent powers of existence. The manuscript catalogue of this part contained none of those general observations, designed to exhibit the scope and results of the author's researches, which the preceding divisions possessed; but the deficiency has been admirably supplied by Mr. Owen, who has given in an introduction a very complete summary of the contents of the volume. The first series of preparations relates to the structure of fruits; and contains a series of dissections which the botanist may consult with advantage, so numerous are the forms presented, and so beautifully are the most important parts displayed. The preparations illustrating the development of the radiated

and molluscous classes are not so numerous as could be wished ; there is, however, a very beautiful series illustrating the progressive stages of formation of the ovum of the cephalopods, the development of the embryo, and the peculiar place of attachment of the pedicle of the vitelline sac. The collection of insect dissections, however, is perhaps a more striking illustration of Hunter's unwearied perseverance, and of his determination thoroughly to explore the mysteries of the subject, than any other in this series. It includes upwards of forty preparations displaying the development of the ovum and metamorphoses of the lepidopterous insects ; the external and internal peculiarities of their larva, pupa, and imago, being illustrated principally by dissections of the silk-moth. An analogous series of forty-five preparations illustrates the whole history of the generative function in the bee tribe ; a part of these are described in Hunter's celebrated memoir on the hive-bee (Phil. Trans. 1792); but the corresponding series, displaying the economy of the humble-bee, is similarly illustrated in a manuscript account of experiments and observations, published for the first time in the volume before us. This beautiful memoir affords an excellent example of the mode in which the habits and general economy of insects ought to be studied. The development and metamorphoses of insects belonging to the other orders are scarcely less fully displayed, as may be inferred from the fact that the number of preparations illustrating the function of reproduction in the entire class is not less than 480.

The numerous preparations of the gravid ovaries, ova, and young of fishes, and especially those relating to the long unknown and much disputed subject of the propagation of the eel and lamprey, receive the same additional interest and value from the manuscript relating to them, as is conferred by Hunter's written record of his lucid and philosophical views upon the other series of preparations that are similarly illustrated. His original observations, included in the present volume, advocate the oviparity of the eel and lamprey from the anatomical conditions and analogies of the female organs ; and the accuracy of the views of Hunter has been subsequently confirmed by the more direct observations on the generation of the eel, made by Davy, and by those experienced icthyologists, Couch and Yarrell. The curious peculiarities in the generation of the cartilaginous and lophobranchiate fishes are not less completely illustrated. Nor are the circumstances attending the development of the embryo in the class of reptiles less fully displayed. Most of the external and internal changes accompanying the metamorphosis of the newt and frog are displayed in elaborate dissections and entire specimens of the larva at each gradation of growth; and with Hunter's accurate knowledge of the anatomy of the siren, amphiuma, and menophoma, the analogy between the permanent states of the latter, and the phases of development in the former could not have escaped him.

One of the most interesting series of preparations in the whole museum, however, is that which illustrates the development of the bird's egg. It contains fifty specimens ; and many of these were delineated by W. Bell, whose drawings have been engraved for the present volume. Of these drawings we cannot speak too highly. They combine every quality that could be desired in the representation of such subjects, and are immeasurably superior to any other delineations we have seen. Their truthfulness must be evident at a glance to any who are acquainted

with the objects they represent; and they will bear the closest examination as to details. When it is considered that these drawings were executed between fifty and sixty years ago, it does not speak very highly for the liberality or judgment of the Council of the College, that they have been so long withheld from the world; since their publication would have been not merely an important boon to the student of embryology, but would have at once established Hunter's claim to the character of a great discoverer. Three of the figures were engraved, but in a very inferior style, for the treatise on the Blood; but the account of them given by the posthumous editor is very imperfect and erroneous. Among the points which they clearly demonstrate is Hunter's knowledge of the existence of the so-called " serous lamina" of the germinal membrane, and of the mode in which the amnion is formed from this; a discovery usually attributed to Pander, whose thesis on the Development of the Egg was published in 1817. The production of the red corpuscles subsequently to the commencement of the circulation of liquor sanguinis is another of Hunter's important observations, since claimed by others, although clearly stated in the treatise on the Blood. " I well remember," says Mr. Owen, " the feelings of surprise with which I listened, while at Paris in 1832, to a memoir read before the Academy of Sciences by MM. Delpech and Coste, the object of which was the announcement of the same fact as a novel and important discovery. The statement of the French observers was received with all the consideration which its importance justly merited, without its being suspected that our great physiologist had half a century before embraced it, with all its legitimate deductions, in the extended circle of his investigations." One of the most remarkable " anticipations" in the paper on the Development of the Egg, is contained in the following passage : " If we were capable of following the progress of increase of the number of parts of the most perfect animal, as they first formed in succession, from the very first to its state of full perfection, we should probably be able to compare it with some one of the incomplete animals themselves of every order of animals in the creation, being at no stage different from some of the inferior orders ; or, in other words, if we were to take a series of animals, from the more imperfect to the perfect, we should probably find an imperfect animal, corresponding with some stage of the most perfect." Again, he says in another place; " We may also observe that the first rudiments of every animal are extremely soft; and even the rudiments of the more perfect are similar to the full-grown imperfect, and as they advance in growth, they become firmer and firmer in texture." It is well known that the deficiencies of Hunter's early education placed him under great disadvantages in regard to the expression of his ideas, particularly when these were of a general and abstract kind ; and this we conceive to have been peculiarly the case with respect to the important generalization in question, which, though now universally recognized, must have seemed to Hunter and his contemporaries a daring novelty.

With these observations we must now close our notice of this truly splendid work, which ought not only to redeem our country from the discredit of being the last to take up the study of anatomy and physiology in a philosophical spirit, but to give satisfactory evidence that the true progress of these sciences is to be dated from the time of Hunter. There is evidence that not only Poli, but Camper, Scarpa, and

Blumenbach, profited by those occasional prelections, in which he explained to some chosen minds which could respond to the conceptions of his own, his great scheme, embracing the demonstration of all the leading modifications of every organ of the animal body, and of the different stages which each organ undergoes in its development, to fulfil the functions it is required to perform in the highest organisms. In estimating, therefore, the share which Hunter had in advancing comparative anatomy and physiology, we must not overlook the influence which these expositions must have had on the subsequent labours of such pupils.

But it is in his Museum that we are to seek the fullest and widest evidence of the advance made by Hunter in the exploration of the *penetralia* of the science of life. It is here that we best discern his unwearied industry in the collection of facts, his sagacity in the grouping together of analogous phenomena, his philosophic grasp of sound inductions, and his intuitive perception of truths which he had not the means of fully demonstrating. " Had the means and time been granted to Hunter to have made public the results of all his labours, or had his manuscripts enunciating, or indicating, so many general principles, been fairly appreciated and given to the world, our teachers of anatomy would not now, after the lapse of half a century, have but begun to explain to their students those beautiful laws of animal development, for the knowledge of which they are indebted to the labours of the professors in the noble schools of physiology in continental Europe, where the spirit of Hunterian inquiries seems to have long so exclusively resided. But the period which has elapsed before those general laws began to be appreciated in the country where they were first detected affords, perhaps, one of the strongest indications of the great advance which Hunter had made in physiological science."*

We have a word to say, in conclusion, to the Council of the College of Surgeons, under whose direction Mr. Owen's labours have been devoted for many years to this splendid work : although its price has been fixed (as we understand) at so low a rate, as barely to meet the cost of print and paper, yet its cost is great enough to put it out of the reach of the class who should most profit by it,—students and junior practitioners. To many of those who would receive from it the highest delight and the greatest benefit, we fear it will remain a sealed book. Now when it is considered that the property of the college is virtually the property of all its members, and not of the council alone, that its funds are derived from the contributions of its members, and that the whole profession, therefore, has already defrayed the expense of the work, we think it would be an act of bare justice to them that they should have the opportunity of possessing themselves of it, at a price little more than nominal. Even if the council have cogent reasons for denying this, they might still do great service by presenting a few copies to the libraries of medical or scientific institutions ; and thus in some degree compensating the inhabitants of the provinces for their want of power to consult the museum itself. Such libraries are seldom in a flourishing state, as regards their funds ; and the purchase of a work of this kind usually involves the necessity of foregoing others of perhaps more practical importance. We trust that our hint will be taken in good part, whether or not it is attended with the desired effect.

* Prof. Owen, in Introduction to vol. iv. of Palmer's edition of Hunter's works.

ART. XIX.

Fourth Report of the Resident-Physician of the county of Middlesex Pauper Lunatic Asylum at Hanwell, October 1st, 1842. 8vo, pp. 49.

THIS is another of those admirable documents to which we have already more than once called the attention of our readers, and which must ever give to the name of Dr. Conolly and of Hanwell a preeminent position in all future accounts of the treatment of insane persons.   To him un-questionably belongs the glory, not indeed of inventing or first applying the practice of non-restraint in the treatment of insanity, but of reducing it to a system, enforcing it on a large scale against all sorts of prejudices, and persevering in its exclusive use, until the eyes of the whole world were opened to its perfect practicability and its infinite superiority over the ancient system of harshness and confinement.   The demonstration of this fact by Dr. Conolly at Hanwell, has had the important result of causing the same rational system, in a greater or less degree, to be adopted at almost all other British asylums, so that the treatment of lunatics by bodily restraint may now be said to be the exception, not the rule, in this country.   The following extracts from the report before us record this most gratifying fact :

" In the mean time, the *entire disuse* of restraints is making a constant pro-gress, every step of which is rendered secure by careful observation.   In the Lincoln Asylum, after many difficulties, the plan, which originated there, seems at length to be completely established.   At Northampton it has been steadily and zealously persevered in.   It has been ably carried into effect at Stafford. Since the recent appointment of Dr. Anderson to the asylum attached to the Royal Navy Hospital at Haslar, it has been adopted with the most entire suc-cess, notwithstanding some peculiar impediments arising from the plan of the building ; and it has been conjoined with several other beneficial alterations, under the high sanction of Sir William Burnett, the head of the medical depart-ment of the navy.   The latest report of the Gloucester Asylum, an institution always distinguished by the early adoption as well as by the suggestion of va-rious improvement, states that the *total disuse* of all mechanical restraints has been sanctioned by the visiting committee, and that ' all the patients are as se-curely managed, and are governed with much less difficulty and disturbance, without than with mechanical assistance.'   In the Lancaster Asylum, containing nearly 600 patients, no restraints have been employed for seventeen months : walls have been lowered, iron bars removed, the means of exercise and recreation increased, and all the parts of an improved system of management carried into operation, notwithstanding some peculiar difficulties.

" In the latest report of the Edinburgh Lunatic Asylum, the physician says, ' For eighteen months I have not considered it necessary to use personal restraint on any occasion during the day.   In one case (a suicidal patient), I have been reluctantly compelled to make use of it during the night ; but with a larger staff of attendants, or a building constructed on the plan of the new establish-ment, I would have been enabled to dispense with it even in that instance.'   The latest report of the Dundee Asylum contains the following brief but satisfactory statement :   ' There is not one patient restrained personally by mechanical means in this asylum.'   In several asylums, where as yet it has not been found practicable to discontinue restraints entirely, they are spoken of as being seldom resorted to.   At York, Ipswich, Dumfries, Belfast, Clonmel, and in the asylums of Worcester, Bloomingdale, and Massachusetts, in the United States, this tes-timony has been distinctly given.   The circumstance of the foundation-stone of a new asylum now erecting near Glasgow, being made the record of the inten-

tion of the directors, that no bodily mechanical restraint shall ever be used in it, is remarkable in the history of asylums; and is no doubt to be ascribed to the opinions formed by Dr. Hutcheson, after a patient and candid inquiry into the merits of this system of treatment." (pp. 43-4.)

The effect of the new system on the patients at Hanwell is thus described by Dr. Conolly, after an experience of more than three years:

"The annual reports presented by the resident-physician in 1839, 1840, and 1841, contain the details of a plan adopted by him from the Lincoln Asylum, and persevered in, with such modifications as experience suggested, with the sanction of the visiting justices, to dispense, in the treatment of the insane, with all the ancient bodily restraints. The difficulties attending the commencement of the undertaking, its progress, and its eventual success, have been already related in those reports without disguise, and, it is believed, without exaggeration. The resident-physician has now but the agreeable task of recording, that time and patience, and the zealous cooperation of all the officers of the asylum, have enabled him to overcome many obstacles, and have confirmed him in a belief, at first encouraged with much diffidence, but now established beyond the likelihood of ever being overthrown, that the management of a large asylum is not only practicable without the application of bodily coercion to the patients, but that, after the total disuse of such a method of control, the whole character of an asylum undergoes a gradual and beneficial change.

"A long indisposition, attended with a mortifying interruption of your physician's active duties, has, by converting him into little more than a spectator of what was taking place, at least enabled him to exercise the calmer observation of a bystander; and his return to the asylum, after the absence accorded to him by the kindness of the visiting justices for the recovery of his health, gave him an opportunity, by the strong impressions incidental to a return to so extraordinary a scene, to appreciate, perhaps more justly than he could otherwise have done, the general results of a system now three years in undisturbed operation, excluding, as much as possible, every cause of physical and mental uneasiness. The appearance and general state of the patients in the wards, or when taking exercise; when engaged with in-door amusements, or when assembled at dinner or supper; when at work in the various departments of industry connected with the institution, or when attending divine service; the order, activity, and cheerfulness pervading the asylum by day, and the tranquillity of the whole house by night, are all indications that the general management of so many disordered minds is productive of those salutary effects which are the object of all management.

"The impression produced on patients newly admitted to the asylum is also strongly indicative of the general character of the place being favorable to curative endeavours. Their wildness and irregularities often rapidly subside, and their habits conform to the general order and the decorous routine so remarkable in the majority of their fellow-patients. The continued operation of a tranquillizing system has produced effects even on the character and manners, and, as it would seem, on the disposition of not a few of the old and incurable patients; several of whom, formerly accustomed to meet the officers with endless complaints, seem now to have lost their fretfulness, and to be satisfied and content. Accidents, anxieties, and agitations must always be incidental to any house in which all forms and varieties of mental disturbance and disease are accumulated; but the resident physician believes that all the officers of asylums who are experienced in both methods of treatment, have found, or will find, that the liberation of their patients from restraints has lessened the frequency of accidents, and diminished the anxieties and agitations of those having the charge of them; so that even the various contrivances at first required for the prevention of evils and inconveniences formerly opposed by restraints, as strong dresses, seclusions, and window guards, become less required.

"It continues occasionally to happen that patients are brought to the asylum

in severe restraints.   These are invariably removed at once ; and they are never put on again : yet from this immediate and systematic liberation not one important accident, scarcely any inconvenience, has arisen.   Every admission more strongly manifests the importance of regulating all the circumstances connected with the arrival and reception of a patient, with a strict regard to reconciling the new comer to the asylum.   The only instance during the last year in which the attendants were set at open defiance, and one of them was severely hurt by a patient just received, occurred in the instance of a male patient, who was so quiet before his arrival, that he had been entrusted to drive the carriage which conveyed him and others during a part of the journey ; but he had been told that the other patients only were to remain, and on discovering this foolish deception, he became, for a day or two, unruly.   He afterwards behaved extremely well.

"The state of mind of a patient of ordinary sensibility, on arriving at the gates of a lunatic asylum, is usually somewhat agitated.   It is then, amidst the fears and distress of the sufferer, to whom all is new and strange, that confidence is to be gained, and the first steps of successful moral treatment are to be taken.   The manner in which new patients are addressed, the attendants to whom they are confided, the personal interest taken in them by the officers, the wards in which they are placed, the employment assigned to them, are all matters of great consequence ; not only as allaying immediate anguish in many cases, but as exercising an influence over every curable patient from the hour of reception to the hour in which they leave the asylum." (pp. 33-6.)

After detailing the very interesting particulars of some cases strikingly illustrative of the speedy influence of the new system, Dr. Conolly continues :

" The difficulty of controlling a violent lunatic in a private house, or in a workhouse, might be admitted as some excuse for the marks of cords and fetters visible on some of the patients ; but others were so harmless, and even so helpless, that their previous coercion could only be ascribed to the unfortunate habit of treating every lunatic with severity.   So long as the asylum, large as it is, is yet inadequate to the reception of all the pauper lunatics of this populous county, there will still be cause to regret that many patients are transmitted to the asylum whom either the long continuance of their insanity, or exposure to previous injudicious management, or both united, have brought into a state unfavorable to the cure or even to any remarkable mitigation of their malady.   At present it sometimes happens that five or six patients are admitted in one day, all brought from some other asylum, and in not one of whose cases there is the slightest hope of amendment ; and there is no doubt that there are, at all times, many recent cases in the county which are gradually falling into the irremediable condition in which they will at length be sent to Hanwell.

" There is, however, great reason to hope that the injudicious practices above alluded to, by which the early and most important period of the malady is too often wasted, will soon be entirely unknown in all asylums, public and private. The reports of many public asylums contain statements and observations strongly indicative of a general and progressive improvement, directed by an increasing conviction, confirmed by all intimate experience with insane persons, that in a large majority of cases of insanity the powers of observation are active, and the understanding has a considerable range of exercise ; whilst the affections exist as warmly, and the sensibility is as acute as in a state of perfect mental health. Instead, therefore, of the majority of insane persons being now consigned to the chance of cruelty or oblivion, the utmost care is taken to act on what remains of intellect and feeling in each case ; so as to direct the impaired faculties of the understanding, if not always usefully, at least safely, and at the same time to cherish and govern the affections by all the resources of compassionate protection.   Such, unquestionably, are the general principles by which the treat-

ment of the insane is regulated at the present period, variously carried into effect in various asylums. The results are daily developing themselves to all daily observers, and can scarcely yet be fully known and appreciated; but every year is affording new and satisfactory proofs that the principles are not dangerous or delusive, but founded in reason and fertile in advantages. Neglect and disregard, violence and intimidation, aided by all the devices of mechanical restraints, are everywhere disappearing; and everywhere, as they disappear, the application of all the powers and influences of sound mind to the recovery of mind impaired takes the place of them. The consequences may not be that a much greater number of perfect recoveries are effected, for recovery is impossible in a majority of cases of insanity; but the actual number of the insane thus kept in the living and intellectual world, and enjoying a great share of happiness, is immensely increased.

"Insanity, thus treated, undergoes great if not unexpected modifications, and the wards of lunatic asylums no longer illustrate the harrowing description of their former state. Mania, not exasperated by severity, and melancholia, not deepened by the want of all ordinary consolations, lose the exaggerated character in which they were formerly beheld. Hope takes the place of fear; serenity is substituted for discontent, and the mind is left in a condition favorable to every impression likely to call forth salutary efforts. A chance is thus afforded, to every impaired mind, of recovery to an extent only limited by causes which no human art can remove." (pp. 40-2.)

Under the heads of ENTERTAINMENTS and INSTRUCTION TO THE PATIENTS, the following most interesting facts are stated:

"The entertainments given to the patients during the year have been more numerously attended, and more varied in character, than in former years. On New Year's eve, about 300 female patients partook of their usual entertainment in one of the wards, which was fitted up with evergreens. Among the patients at this party there were nineteen who were formerly always, or almost always, in restraints. During the summer, the matron's birthday was celebrated by a still larger party of the female patients, who drank tea, danced, and played various active games in the field in front of the left wing.

"Until this year, the male patients had not been indulged with any similar entertainments; but in January last, rather more than 200 of them, including all who are employed in any way, had coffee and cake in the evening, then amused themselves by singing, dancing, and music, some of the attendants giving able assistance, until eight o'clock, when they had an excellent hot supper (roast beef and apple pies), with one pint of beer, some tobacco, and a new pipe for each patient desirous of smoking. The scene presented by them was one of the utmost cheerfulness and good humour. All behaved well; thus showing that the male patients are no less capable than the female patients had been found to be, of partaking of moderate gaiety without any neglect of decorum. Several banners were hung over the tables, made by one of the patients, and containing mottoes complimentary to the magistrates and to the officers. One of them was inscribed, 'To our noble selves.' The wards were all visited late at night, and only one or two patients were noisy, and these had not been at the party. A few days afterward a grave elderly Scotch patient, who lays claim to titles and wealth, expressed a wish to the house-surgeon that he would give 'those rebels' who slept in the same room with him, 'a supper every night;' for that whereas they were usually singing and noisy, they were on that particular night perfectly quiet.

"During the summer, about the same number of the male patients had an entertainment out of doors, for which occasion a band of music was organized, consisting partly of patients. One of the most violent and troublesome men in the house, an old soldier and bugler, beat the brass drum very correctly, although rather more vehemently than was required."

"To look upon these entertainments as mere occasions of display, would be

to degrade them from their principal use. Their effect is to cheer and console the depressed, as manifestations of the consideration felt for them, and the desire entertained for their happiness, and to interrupt the unhappy thoughts of the more disturbed with the associations of innocent diversion and joyousness. Such evenings are known to be looked forward to with pleasing anticipations for several weeks, and the patients join in the bustle of preparation for them with alacrity and cheerfulness. The happy assembling, the delight evinced by many during the hours of the entertainment, the gratified expressions of the patients on the breaking up of the party, their orderly and good-humoured departure from the scene of this simple gaiety, leave the unaccustomed spectator impressed with wonder, and those most familiar with such a scene filled with the emotions naturally arising from the view of so much happiness, created by the mere exercise of kindness, in mansions thought to be dedicate only to scenes of suffering and woe.

"If even these effects were merely transient, their advantage might be deemed inconsiderable. But they are not so. For weeks afterward the patients retain an agreeable recollection of their 'pleasant party.' The little indulgences then permitted are found to blend themselves with all the best parts of moral management, and to contribute to secure the confidence and the affection of the insane. The gratitude thus created becomes a bond of great power; for the patients, in general, fully appreciate all that is done, not only to protect them from suffering, but to impart positive comfort and enjoyment to them." (pp. 26-9.)

"By the kind exertions of the chaplain, an attempt has recently been made, with the resident-physician's cordial concurrence, to ascertain the practicability of imparting some general as well as religious instruction to a certain number of the male and female patients, of various degrees of capacity. This has been done by the establishment of reading classes, to which such patients were admitted as appeared to be capable of reading and understanding the simple books placed in their hands, or as were particularly desirous of joining a class.

"They attended about twice a week, for an hour, in classes varying from six to fourteen in number. Each patient read a few passages in turn, and the subject of the reading, which was always of a kind easy to be understood by those who were in the class, was rendered clearer or more amusing by the help of pictures, or a map, or a familiar explanation. It was interesting to observe the effects of these efforts on the patients. An elderly male patient was at first remarked always to attend without his spectacles, which he alleged as an excuse for not taking his part in the reading; but after a few attendances, he seemed to become less diffident or less distrustful of himself, and when he had finished a passage he expressed great satisfaction at his own success. A female patient evinced, at first, a similar reluctance; but afterward read willingly to the chaplain when in her own ward. Another patient, an epileptic woman, at first articulated with difficulty; but appeared to improve at each successive reading. The patients frequently corrected the reading of those who read incorrectly, and their interference was submitted to with perfect good humour. One patient, who could not be persuaded to read, was interested in the explanation of what was read; and all seemed to be pleased with the map of Palestine and with the illustrative pictures.

"About 120 patients on each side of the asylum were thought by the chaplain, after careful inquiry, to be capable of attending such classes with more or less advantage: but, among those who shared his attention in the course of this interesting and benevolent experiment, there were some of very feeble understanding and unacquainted even with the alphabet. Yet some of these evinced pleasure when an attempt was made to teach them. One poor epileptic boy learned all the letters in about ten lessons. Others, of very unpromising appearance, were found able to repeat more or less of the Lord's prayer; and they did this with folded hands, and in a manner showing that the recollection of some early lessons was not wholly effaced.

" All the experience obtained in these attempts was, in short, of a nature to encourage perseverance in, and an extension of them; and to make it appear probable that most of the aids of juvenile, or at least of infant education, might be introduced into lunatic asylums for the poorest patients, with results not only singular in their character but generally beneficial to the patients, and in accordance with all that is endeavoured to effect for them by other means." (p. 30-1.)

It is impossible to read these beautiful passages without deep emotion, fraught as they are with the lessons of a pure and genuine philanthropy, and recording one of the most glorious, because one of the serenest and most peaceful triumphs of humanity. Well does this Report vindicate the claim of HANWELL to the motto which we have assigned to her in another page:

" Hier wird durch die That bewiesen, was der Mensch ueber den Menschen durch das Menschliche vermag."

Art. XX.

The Physical Diagnosis of Diseases of the Lungs. By Walter Hayle Walshe, m.d., Professor of Pathological Anatomy in University College, London; Physician to the Hospital for Consumption, &c. &c. —*London,* 1843. 8vo, pp. 320.

Had this book reached us at an earlier period of our trimestral labours, we should have felt it our duty to give a detailed account of its contents, although they are of a kind which scarcely admit of further compression by analysis. Under present circumstances, we must content ourselves with a brief exposition of the nature and plan of the work, and a statement of the judgment we have formed of its merits after a careful perusal.

The following extracts from the preface and table of contents give a complete view of the author's plan.

" In the first of the three parts, into which the work is divided, the various methods of physical examination, and the phenomena detected by them in the states of health and of disease, are described. In the second part will be found a tabular view of the physical causes and ordinary seat of all morbid signs, in connexion with the names of the diseases in which they occur; and also a synopsis of the signs attending each affection of the lungs, pleura, and larynx. The third part forms a commentary upon the two preceding. By excluding from the descriptive portion any discussion upon debateable points, and in the tabular views by distinguishing with a different type the more striking phenomena from those less constantly useful and available in practice, I have, I trust, succeeded in adapting the book for beginners. The attention bestowed upon them in the Commentary will, however, show that I do not undervalue delicate signs: far from this, I know by experience that in many instances apparently trivial phenomena will justify a diagnosis that without their aid had been altogether unwarrantable. I have avoided, as far as possible, all disquisition upon the acoustic principles regulating the production and transmission of sounds; not on account of any deficiency of interest or importance on the subject, but because I was unwilling to increase the size of the book, or deprive it of the simple practical character I had aimed at giving it."

" Part I.—General description of the methods of physical diagnosis.

" Sect. I.—Inspection:—Results of inspection of the natural state; morbid states discovered by inspection.

In the treatment of the subjects thus lucidly arranged, the author has shown great skill and judgment, and has displayed such a thorough practical familiarity with every one of them, as cannot fail to gratify every reader.   True to his plan of furnishing a real practical guide to physical diagnosis, Dr. Walshe in the first two parts has not allowed himself to be seduced into any unnecessary details of matters of fact, or into any discussion on doubtful or disputed points ; while in Part III, (*the Commentary*,) which occupies half the volume, he has treated, in the most perspicuous manner, and in the most condensed form, of almost everything—whether relating to theory or fact—which has engaged the attention of auscultators since the days of Laennec.

We regret that we are not able to give a series of continuous extracts as specimens of the different divisions of the book, to show the precise manner in which are they handled ; and our readers must be content to take our word for what such specimens would demonstrate—that the treatise is one of extraordinary merit.   Indeed we do not hesitate to say that there exists in no language any work on the physical diagnosis of diseases of the lungs, suited for students, so clear and precise, and at the same time so comprehensive and practical as this.   It is one which no learner in auscultation can fail to possess, without losing advantages elsewhere unattainable; and it is one which very few even among the most experienced auscultators will consult without adding something to their previous stock of knowledge.

We trust the author intends soon to complete his plan by giving us the physical diagnosis of the diseases of the heart and great vessels ; and we would recommend him to render the work still more perfect, by adding the physical diagnosis of the diseases of the abdomen.

PART SECOND.

Bibliographical Notices.

Art. I.—*Ausführliche Encyklopädie der gesammten Staatsarzneikunde.*
Von Georg Friederich Most, Doctor der Philosophie, Medicin
und Chirurgie.—*Leipzig*, 1838-9-40. Zwei Bände. 8vo, pp. 1132,
1190.

A Complete Encyclopædia of State Medicine. By Dr. George Fred.
Most. In Two Volumes.—*Leipzig*, 1838-9-40.

In a former number of the Review (No. XIV, April 1839, p. 530,) we
noticed the first appearance of the Encyclopædia of Dr. F. Most. We
at that time expressed the opinion that this was not a convenient form
for conveying practical information on the science. That opinion is con-
firmed by the examination of the two enormous volumes in which the
work is now completed. The title strictly implies a Dictionary of State
Medicine, but the articles refer to almost every conceivable subject be-
longing to the physical and moral sciences. Thus articles on every branch
of medicine and surgery are mixed up with essays on metaphysics, mes-
merism, homœopathy, and quackery. There is an article also on tem-
perance societies (Mässigkeits-gesellschaften), in which the political and
medical consequences likely to result from the diffusion of temperance
principles are discussed. In short, this work would be better entitled an
Encyclopædia of general Knowledge; for in most of the essays the ori-
ginal object of the editor seems to have been entirely abandoned. We
are not surprised that an attempt of this kind should have failed: it is
another illustration of the old Latin proverb, " ne quid nimis." Had
Dr. Most confined the work to subjects strictly appertaining to medical
jurisprudence and police, it would have been reduced to one third of its
present unwieldy size, and might have made a volume of good practical
information.

As we might have anticipated it has been found necessary to add many
omitted articles, in the shape of an appendix. This appendix is not yet
completed, and, judging from appearances, it is likely of itself to form a
small encyclopædia.

It is only fair to the editor to observe that many of the essays on me-
dical jurisprudence, as well as those on medical police, are very creditably
written. They are, for the most part, compilations from well-known
authorities. Thus the subject of toxicology is almost entirely extracted
from the works of Orfila, Christison, and others. The article on arsenic
contains no reference to Marsh's test, or Orfila's late discoveries, not
even in the appendix! In general, however, the subject of toxicology is
very well treated. The essay on infanticide, which is rich in historical is
deficient in practical information. There are one or two excellent articles
on the general rules to be pursued in the analysis of poisons, where the

nature of the substance is unknown. This is a subject not commonly treated in works on toxicology, and we therefore refer to them those who may have access to the work. We do not make any extracts from this Encyclopædia in reference to medico-legal subjects, because by so doing we feel we should only be reproducing what has already appeared in this Journal, in reviewing the works of Orfila, Devergie, and others.

Dr. Most's work, although essentially written with a view to German practice and principles, contains information which will be useful to scientific men of all countries. We fear, however, from its size and plan, its circulation out of Germany will be limited. To an Englishman it would certainly be a matter of considerable difficulty, to know where to refer for the information which he might require.

Art. II.—*Observations on Ulcers of the Legs and other parts, showing that the most obstinate and intractable cases may be speedily cured by mild methods of treatment; to which are appended some remarks on Scrofulous Disorders.* By Archibald Maxfield, Surgeon to the South Hants Infirmary, &c.—*London,* 1842. 8vo, pp. 80.

The author's assertion is that all ulcers on the legs, which are not strictly constitutional, depend on or are aggravated by disease of the adjacent veins; and that they may all be cured by filling their cavities with sponge or lint, or some mild soft substance, and applying a bandage smoothly and firmly over the whole leg. This is the substance of all that is worth attention in the book.

Had the author had no other object than that of recommending this well-known, though rather neglected, method of treatment, he would have attained his end more certainly by making of his book a short paper, and communicating it to some weekly medical journal. Three pages would have contained all that he really had to say. The appended remarks on scrofula, which contribute twelve pages to the making of the book, seem to be taken from some of the minor elementary works on surgery.

Art. III.—*Clinical Midwifery; with the Histories of Four Hundred Cases of Difficult Labour.* By Robert Lee, m.d. f.r.s.—*London,* 1842. 12mo, pp. 224.

This little work consists mainly of a series of reports published some time ago in the Medical Gazette, a fact which should have been noticed. These reports, we are told by the author, " comprise the most important practical details of all the cases of difficult parturition which have come under his observation during the last fifteen years; and they are now published in the hope that they may be found to illustrate, confirm, or correct the rules laid down by systematic writers for the treatment of difficult labours." Works of this sort, from men of ability and learning, are always valuable and useful; and that Dr. Lee possesses both these requisites is well known to the profession at large. We think that if the author had given, in a condensed form, the practical conclusions deducible from these cases, in a continuous series of aphorisms, the small volume would have been found of more use to the practitioner. As it is, it deserves the attention of all engaged in the line of practice to which it relates.

ART. IV.—*The Prescriber's Pharmacopœia: containing all the Medicines in the London Pharmacopœia, arranged in classes according to their action, with their composition and doses.* By a PRACTISING PHYSICIAN. Second Edition, corrected and enlarged.—*London,* 1843.   32mo, pp. 149.

WE gave an account of the first edition of this little work in a former Number, (vol. XII. p. 221.) Its having reached a second edition so soon, justifies the opinion we then gave of its value. In the new edition it is much improved in plan, and contains a good deal of new matter. It is decidedly one of the most useful little works that has appeared for a long time; and we recommend it to the attention of every prescriber.

ART. V. — *Recherches Anatomiques, Physiologiques, Pathologiques, et Séméiologiques, sur les Glandes Labiales.* Par A. A. SEBASTIAN, Professeur à l'Académie de Groningue.—*Groningue,* 1842.   4to, pp. 21.   Avec une Planche.
Anatomical, Physiological, Pathological, and Semeiological Researches on the Labial Glands. By A. A. SEBASTIAN, Professor in the Academy of Groningen.—*Groningen,* 1842.   With a Plate.

THE glands here treated of are generally known as forming a layer immediately beneath the mucous membrane of the lips. They have a conglomerate structure, with a single-trunked, branching duct, of which the branches seem to terminate in cells; and they secrete a transparent somewhat viscid fluid, containing elements and particles of epithelium, which the author supposes, though more from good reason than from evidence, to be analogous to saliva.

The novelty of the work is a somewhat detailed account of the diseases of these glands, which are as follows; and we may remark that we can confirm, in many respects, the account which is given.

1. *Obstruction of the excretory duct,* producing most commonly a small, transparent, vesicular, or hydatid-like tumour, which contains a clear viscid fluid. Such tumours are seldom larger than a pea, and are easily cured by puncture. More rarely the obstruction produces a small indolent, acne-like tumour or tubercle, which contains a thick, white, unctuous substance.   2. *Atrophy,* which the author has seen well marked in two cases of cancer of the lip.   3. *Active or passive congestion,* in which the glands are swollen and form small round or oval red eminences on the inner side of the lips. They secrete at the same time a large quantity of somewhat turbid or reddish fluid, with which even blood is sometimes mixed. This is the most frequent disease of the glands, and and it is especially common in young children, in whom it occurs chiefly, though not exclusively, in difficult dentition, in follicular duodenitis, and in typhoid fever. The author believes that the inflammation of these glands may be taken, with some confidence, as a sign of affection of the duodenum, for in all the fatal cases of typhus in which it was seen the duodenum was found to be diseased.   4. *Ulceration,* which is seen in the form of small deep ulcers; a rare disease and quite distinct from aphthæ and *muguet,* which the author has clearly determined have no connexion with the labial glands.

Art. VI.—*The Retrospective Address delivered at the Tenth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Exeter, Aug. 3d and 4th,* 1842. By James Black, m.d. &c. —*Worcester,* 1842. 8vo, pp. 146.

This is a document full of interesting and valuable matter, and, therefore, well worthy the attention of the profession. We think it both too long and too minute for a spoken address; but it is on this very account of more value to the reader. If the Provincial Association did nothing more than give occasion to these annual retrospective surveys of the medical sciences it would deserve all the encouragement it receives.

Art. VII.—*Retrospect of the Progress of Medicine and Surgery for the year* 1841-2. By Mr. E. O. Spooner and Mr. W. Smart. *Read before the Southern Branch of the Provincial Medical Association.*—*Blandford,* 1842. 8vo, pp. 87.

This is another excellent retrospect of the same kind as the foregoing, and shows that the branches of the Provincial Association are worthy scions of the parent-stem. The fact of a work of such learning and research emanating from two general practitioners resident in small country towns, speaks well for the state of medical knowledge in the provinces. Thirty years ago such an event could scarcely have occurred ; now, we believe, there are few districts in the kingdom which might not furnish a parallel to it.

Art. VIII.—*The Great Physician ; the Connexion of Diseases and Remedies with the Truths of Revelation.* By John Gardner, Surgeon.—*London,* 1843. 8vo, pp. 359.

With the exception of the last chapter, which contains " a brief history of epidemic diseases, or pestilences," the contents of this volume are exclusively of a theological character, and come not, therefore, within our jurisdiction. When the second part is published, which will principally consist of medical matters, we may return to the work. The author is evidently a very sincere and pious person, but we suspect that he is too enthusiastic a religionist to deal philosophically with such a subject.

Art. IX.—*On Diseases of the Bladder and Prostate Gland.* With Plates. By William Coulson. Third Edition, revised and corrected.—*London,* 1842. 8vo, pp. 274.

Having noticed the two former editions of this work, (see Vol. VI. p. 509, and Vol. X. p. 247,) we will now only say that it is still further improved in the present; particularly in the chapters devoted to the Urine, to Calculus, and to Affections of the Prostate. It is now a handsome volume, and one of great practical value.

PART THIRD.

Selections from the British and Foreign Journals.

ANATOMY AND PHYSIOLOGY.

On the Composition of Fibrin. By M. BOUCHARDAT.

THE author of this communication is well known, as the ingenious introducer of the *gluten bread*, which promises to be one of the most important aids in the dietetic treatment of diabetes. He is at present engaged in a series of experiments on the proximate principles of organized bodies; and he has been led by them to entertain some novel views on the nature of fibrin, of which the following is a brief account.

He premises by stating that his experiments have been made upon fibrin separated from the blood by beating it with a stick, and upon the buffy coat of inflammatory blood. When a piece of the buffy coat is boiled in three or four times its weight of water, after having been well washed in cold water, it is reduced to about half its volume, and the water is found to hold in solution a considerable quantity of a gelatinous substance, which is sometimes enough to form a jelly on cooling. That this is true gelatine, without any mixture of albumen, appears from the action of the usual tests. The proportion of gelatine in the blood is extremely variable. In the blood of a person in health, it is sometimes difficult to establish clearly the presence of gelatine; but in inflammatory affections of the serous and cellular tissues, the proportion increases very greatly. This is a fact of great pathological interest.

Besides gelatine, two other substances are considered by M. Bouchardat to exist in fibrin. When a piece of fibrin is placed in water containing only 1-2000th part of muriatic acid (a mixture so weak as scarcely to affect litmus paper, or to be perceptibly sour to the taste,) it immediately swells and becomes flocculent; by a prolonged maceration the greater part is dissolved; but there remains a substance which is not attacked by an excess of the solvent, and which appears to M. Bouchardat identical with the basis of the epidermic tissues and of their horny appendages. For this substance he proposes the name of *epidermose.*

The acidulated solution appears to contain a large proportion of an albuminous compound, which is precipitated by an excess of nitric or muriatic acids, and redissolved by a still greater excess; flocculi are also precipitated by heat; and an abundant precipitate is thrown down by a solution of bichloride of mercury, prussiate of potass, and tannin. When examined with polarized light, it causes a deviation of the rays to the left. Hence this compound is regarded by M. Bouchardat as identical with the albumen of the egg; and he names it *albuminose.*

The acidulated solution, however, probably contains gelatine also; for M. Bouchardat has ascertained by a parallel experiment, that water thus acidulated will slowly dissolve isinglass at a temperature of about 68° Fahr. This last experiment is considered by him as proving that gelatine pre-exists as such in the animal tissues (which has been denied by some); since it is scarcely to be expected that water so feebly acidulated could effect any considerable transformation at the ordinary temperature.

This solvent action is not confined to muriatic acid, but is possessed by several

other acids, even by those which, in larger proportion, precipitate albumen from its solutions, by forming with it insoluble compounds.

The gluten of wheat, when acted upon by a similar acidulated fluid, forms a limpid solution, which resembles, in all its chemical reactions, that of the albuminose of fibrin; but it contains no principle analogous to epidermose. The serum of the blood, the albumen of the egg, and the caseum of milk, when treated in the same manner, afford analogous results.

The following conclusions are drawn by M. Bouchardat from these important experiments:

" 1st. Fibrin, when separated from fatty matter, is composed of three proximate principles in variable proportions;—a substance identical with pure non-coagulated albumen, for which I propose the name of *albuminose:* this fluid albumen is imprisoned in a network of a tissue composed of *gelatine,* and of a principle possessing all the properties of the epidermic formation, for which, on this account, I propose the name of *epidermose.*

" 2d. The fundamental principle which we find in the albumen of the egg, in the serum of the blood, in the gluten of the cerealia, and in the caseum of milk, is always identical; it is albuminose mixed or combined, sometimes with earthy matter, as phosphate of lime and magnesia; sometimes with alkaline salts; sometimes with fatty matters; which extraneous substances mask its essential properties. When, by the operation of an almost unappreciable proportion of acid, we have destroyed this transient combination, the solution of albuminose possesses identical properties, exerting precisely the same chemical reactions, having the same influence on polarized light, and possessing an energy (other things being equal,) exactly proportionate to the quantity of the substance dissolved."

This last statement may, we believe, be accepted as truth; since it bears a very close correspondence with the results of the analogous experiments of Mulden and other German analytical chemists. And with respect to the former, we do not see any ground for hesitating to accept the conclusion of M. Bouchardat, that gelatine exists in small quantity in the blood; and that its amount is much increased in certain pathological conditions. That gelatine exists in the blood has always been considered probable; especially since our increased knowledge of the chemical relations subsisting between gelatine, fibrin, albumen, &c., has made it almost certain that the gelatine derived from the food cannot be converted into an albuminous or fibrinous tissue, but can only be employed for the nutrition of the gelatinous tissues. (See vol. XIV. p. 510.) That a substance resembling the horny matter of the epidermic tissues, also, should exist in the blood, appears quite consistent with our previous views; since the elaboration of this matter, like that of fat, may be regarded as holding a middle place between the functions of nutrition and secretion, and as probably taking place in the blood during its circulation. By a reference to the comparative table of the constitution of the different proximate principles, which we extracted in our last volume (p. 513,) from Liebig's work, it will be seen that the epidermic substance does not depart so widely as gelatine from the composition of fibrin, albumen, &c.; so that its elaboration from them may be a very simple process.

We can by no means assent, however, to the view of the nature of fibrin which M. Bouchardat seems desirous of founding upon these experiments,— namely, that in the clot of blood there is a network composed of gelatine and epidermose, imprisoning fluid albuminose. It is to be remembered that most of his experiments on this subject were made on the buffy coat; and these cannot be regarded as affording sufficient ground for such a conclusion in regard to the ordinary crassamentum. We have always held that fibrin differs from albumen more in its *vital* properties than in its purely chemical relations; and we see no reason to alter our opinion. Fibrin we believe to be albumen in process of organization; that process is continually taking place in the living body; and the constant withdrawal of the fibrin for the nutrition of the tissues is compensated by a conversion of fresh albumen into fibrin. The process is seen distinctly in the gradual organization of coagulable lymph; and the ordinary

coagulation of the blood appears to us a step in the same process, which does not go further because the blood is not in contact with a living surface. A precisely analogous series of gradations is noticeable in plants, where *gum* answers to the *albumen* of animals; whilst the *fibrin* is represented by the peculiar glutinous substance contained in the elaborated sap, which is evidently the pabulum from which the old tissues are nourished, and the new ones formed. To deny the distinct existence of fibrin, as such, (which M. Bouchardat seems inclined to do,) is just as unphilosophical as it would be to deny the existence of muscular fibre as a distinct substance, because, in its purely chemical relations, it may correspond with the albumen of the egg or the gluten of wheat. Moreover, there is a total absence of proof that anything like the gelatinous or epidermoid tissue described by M. Bouchardat really exists in the blood; on the contrary, we believe it to be yet undetermined whether gelatine is ever organized at all, or whether both it and the epidermic substance are not deposited in cells composed of fibrinous tissue, as fatty matter is well known to be. Further, it is well known (especially through the inquiries of Mr. Gulliver) that the fibrinous clot is hardened by long boiling, and that the fibrous appearance it presents becomes more distinct; precisely the reverse would be the case, if the areolar tissue were composed, even in part, of gelatine. In what relative condition the three principles,—namely, the true fibrin, the gelatine, and the epidermose,—exist in the crassamentum, remains a subject for future inquiry, in which microscopical and chemical investigations must go hand in hand. The great increase of gelatine in the blood, during inflammation of the gelatinous tissues, and the corresponding increase of the colourless corpuscles, naturally suggests the idea that the two phenomena may be in some degree related.

Comptes Rendues, 1842.

Revival after Freezing.

In the winter of 1828-9 in Ireland, Gaimard found that toads could be completely frozen, so that ice lay in small pieces between their muscles, their bodies became quite hard, stiff, and motionless, broke easily and without any effusion of blood, so that, in short, every trace of life disappeared, and yet in ten or twelve minutes they could be revived by immersing them in very slightly warmed water. If they were too quickly frozen they did not revive.

Bibliothèque Universelle, 1840 ; *and Müller's Archiv*, 1841 ; *Jahresbericht*, p. iii.

Effects of a Solar Eclipse on Animals. By M. ARAGO.

In his report on the eclipse of July 8th, M. Arago mentions in support of a popular notion which he had always disbelieved, that a friend of his put five healthy and lively linnets in a cage together, and fed them immediately before the eclipse. At the end of it three of them were found dead. Other indications of the alarm it produced were seen in a dog which had been long kept fasting, and which was eating hungrily when the eclipse commenced, but left his food as soon as the darkness set in. A colony of ants which had been working actively, suddenly ceased from their labours at the same moment.

Gazette Médicale.   Août 27, 1842.

On the Decussation of Fibres at the base of the Brain. By M. FOVILLE.

THE author points out, what all admit, that the extent of the decussation of fibres commonly demonstrated between the corpora pyramidalia is not sufficient to account for the completeness of the paralysis of one side of the body when the other side of the brain is impaired. "There is no proportion as to size, between their discussating fibres and their point of origin, the crura cerebri, or their termination, the anterior fasciculi of the spinal cord." He has succeeded however in demonstrating "a decussation at the commencement of the spinal

cord, not through an extent of a few lines only, or by only a small number of filaments, but through the whole distance which separates the basis of the crura cerebri from the medulla spinalis properly so-called."

The anterior columns of the cord, when arrived at the medulla oblongata, separate from the middle line to give place to the corpora pyramidalia, and at the level of the tuber ascend and pass at right angles over the uppermost of its arcs. The posterior columns on the other hand pass outwards from the apex of the columns going to the cura cerebelli, and leave exposed the anterior fasciculi, which are then visible behind through the whole length of the floor of the fourth ventricle, and along the aquæductus sylvii to the infundibulum.

The crura cerebri, for their part, form, from above downwards, a section of a cone, of which the fibres, instead of taking a straight direction, are turned spirally, and successively approach the median fissure into which they penetrate and plunge into the inner part of the anterior fasciculi of the medulla spinalis. The fibres from the right crus thus pass into the prolongation of the left ante-rior fasciculus, and *vice versâ.* Along their course, the crura constantly giving off fibres which pass thus from one side to the other, gradually grow thinner, and at their exit from the tuber they constitute only the base of the anterior pyramids. The same circumstances continuing they become finer and finer till their very apices decussate at the boundary between the medulla spinalis and medulla oblongata. The transference of all the elements of the crura cerebri from one side to the other of the nervous axis is thus completed.

The mode of demonstrating this arrangement is to separate the two lateral portions of the nervous axis from the apex of the calamus to the infundibulum by separating the borders of the median grove. When this is done gently, each half may be seen to furnish an infinity of fibrous fasciculi of various size, which pass across the interlacing with each other.

Bulletin de l'Académie de Médecine.   Août, 1842.

New Ganglia of Nerves discovered by Dr. REMAK.

IN a short memoir, in *Casper's Wochenschrift* for 9th March, 1839, Dr. Remak mentions that he has discovered in the human subject small ganglia on the fila-ments of the cardiac nerves as they are ramified on the surface of the heart. These ganglia are very small, but when examined under the microscope the cha-racteristic gray corpuscles placed among the filaments of the nerves leave no doubt as to their nature.

In the *Medicinische Zeitung,* of the 8th January, 1840, Dr. Remak announced that he discovered small ganglia upon the branches of the sympathetic as they enter the lungs.

" The par vagum branches of the bronchial nerves (he says) run, as Reisseisen has already pointed out, along the subdivisions of the bronchial tubes nearly to the surface of the lungs. According to my researches they remain white, contain a disproportionate number of white primitive fibres, and present no ganglionic swellings. On the other hand, those from the bronchial plexus which enter the posterior part of the lungs are gray, and contain a great num-ber of gray or organic fibres. They give off smooth non-ganglionic gray branches which run below the pleura, and are probably distributed in it. The principal portion, however, run upon the bronchi, soon lose themselves in the walls of these tubes, and present on their finer ramifications, as in the cardiac nerves, small ganglia, some of which may be recognized by the naked eye, others only by the microscope. In these ganglia I have also, as in those upon the cardiac nerves, ascertained that there is an increase in the organic fibres."

Dr. Remak also states that he has discovered ganglia upon the smaller branches of the *superior laryngeal nerve* in man, in swine, the ox, the sheep, and the horse. A pretty large ganglion is placed on both sides, is very constant and generally symmetrical, on the branch of the superior laryngeal nerve which is distributed upon the epiglottis. He also found ganglia upon the branches of the

glosso-pharyngeal nerve. All these ganglia are placed upon the filaments of the sympathetic which join themselves to those cerebro-spinal nerves. He has not been able to detect these ganglia upon the gray branches of the nerves, of the kidney, the spleen, and the liver.

In another short paper, in the *Medicinische Zeitung* for 15th April, 1840, Dr. Remak gives the result of his researches upon the nerves of the uterus and the bladder. He states that from the difficulty of procuring the impregnated uterus in the human species, his observations were made upon the human unimpregnated uterus, and upon the impregnated uterus in the lower animals. The nerves of the unimpregnated uterus in the domestic animals are in relation to the size of that organ of very great fineness, even more so than those of the liver. These uterine nerves are whitish from the preponderating number of primitive tubes (primitivröhren) entering into their formation, and in general are without ganglia. In swine, however, small ganglia are regularly found on the trunks of the uterine nerves on both sides of the organ in the unimpregnated condition, but the further divisions of these nerves present none. During the progress of utero-gestation, as Tiedemann has already observed in the human species, the size of the uterine nerves is remarkable, and they may then, as for example in swine, be readily followed into the cornua, and in sheep to the bottom of the uterus.

" I have suggested on these grounds, and this suggestion is elsewhere mentioned, that the increased size of these nerves during utero-gestation was dependent upon an increase in the growth of the organic nervous fibres. This opinion has now been fully established, for the nerves of the impregnated uterus are gray, and composed of a relatively greater number of organic fibres, which during utero-gestation evidently increase the mass, while the number of primitive fibres which come from the spinal cord continue unchanged. Peripheral small ganglia which the analogy of the heart leads me to expect, I have not hitherto found on these gray fibres."

Dr. Remak also mentions that, on the filaments of the sympathetic distributed on the walls of the bladder he has found small ganglia. He believes that to this class of ganglia ought to be referred the small ganglia described by Müller to exist on the nerves of the penis on their entrance into that organ.

On the Erectility of the Iris. By Professor GROMELLI, of Modena.

FONTANA's argument against the erectility of the iris, viz., that the finest and most penetrating injections, thrown into the arteries, even immediately after the death of an animal, never produce any extension of the iris, like what happens to the corpora cavernosa, we find controverted in a recent Italian journal. The substances which Professor Gromelli has found to succeed best for minute injections of the iris, are olive or walnut oil, coloured in various ways. He states that these injections penetrate into the most delicate ramifications, without becoming extravasated, and preserve for a long time the parts impregnated with them. In injecting the dead bodies of infants, Professor G. observed that the iris, previously relaxed, swelled up, and that the pupil, previously much dilated, contracted to the extent of more than half its diameter, just as it is seen to do when the retina is struck by the light during life. This fact seems to prove, that the iris is composed of blood-vessels. By the aid of the microscope they are seen disposed, between the ciliary and pupillary edges of the membrane, in rays, partly rectilineal, partly serpentine, while a few run in a circular direction. It results from such a disposition of radiating vessels, fixed at the great circumference of the iris and free towards the pupil, that the sanguineous turgescence expands this membrane and contracts the pupil, while the return of the blood allows the membrane to shrink and the pupil to expand. The professor concludes, that the iris is composed of a vascular turgescible, or erectile, tissue.

Memoriali della Medicina Contemporanea.

On the Pus-like Globules of the Blood. By Mr. GULLIVER.

THE pus-like globules found in the blood of patients affected with severe inflammatory and suppurative diseases are very like the pale globules of healthy blood; but there are some points of difference which the author now describes, with the aid of engravings.

In inflammatory affections, the pus-like globules of the blood are generally rather larger, more irregular in size and form, and often more opaque, than the pale globules of the blood of healthy animals. In disease, the pus-like globules are frequently clustered together, and commonly much more numerous than in health.   In a fatal case of inflammation and suppuration of the leg, for instance, there was about half as many pus-like globules in the blood as red discs. When the pus-like globules occurring in disease are treated with dilute acetic acid, the molecules composing the nucleus are observed to be surrounded, and often widely separated, by a quantity of very minutely granular matter, which is either less obvious, or even absent, in the pale globules of healthy blood which have been subjected to the action of the same acid.

The globules occurring in disease are sometimes still more peculiar. These, in a fatal case of inflammation and suppuration, were abundant in the venous blood. They are described and figured as composed of one or more red corpuscles, apparently blood discs, included in a delicate and pale envelope.

London and Edinburgh Philosophical Magazine.   Sept. 1842.

On the Structure of Fibrin, and of False Membranes.   Origin of Fibre.
By Mr. GULLIVER.

A CLOT of fibrin is made up of fibrils of extreme delicacy and tenuity, of corpuscles having the characters of primary cells, and of very minute molecules. The fibrils may either form a network, or they may have a parallel arrangement as in perfect membrane. It has commonly been supposed that fibrin only presents an organized appearance when it has coagulated in contact with the living textures, but the fibrils and corpuscles are perfectly distinct in fibrin which has coagulated after its removal from the body.

If fibrin, which has clotted quite independently of the inflammatory process, presents a curious and complicated structure, and is in fact really organized, it may be easily understood (as noticed in the Appendix to Gerber's Anatomy) that inflammation may be quite unnecessary to the healing of wounds, thus supporting the conclusion to which Dr. Macartney long since arrived by a different train of inquiry.

The structure of false membranes is either analogous to or absolutely identical with that of fibrin above mentioned.

The well-known theory of Dr. Schwann ascribes the origin of all the tissues to the formation, in the first instance, of round cells, and the change of these into the various fibres and other textures. Hence the following questions arise:— How is the origin of the fibrils of fibrin to be reconciled with the theory of Dr. Schwann? What is the proof that these fibrils may not be the primordial fibres of many animal textures, the filamentous and its modifications for example?   Mr. Gulliver could see no satisfactory evidence that the fibrils of fibrin are merely changed cells, for these fibrils may be observed so quickly after coagulation, that their production, according to the views of Dr. Schwann, would hardly seem possible. Nor did it seem that the fibrils arose from the interior of the blood-discs, like certain fibres depicted in the last researches of Dr. Barry.

London and Edinburgh Philosophical Magazine.   October, 1842.

PATHOLOGY, PRACTICAL MEDICINE, AND THERAPEUTICS.

On the Employment of large doses of Sulphate of Quinine in the treatment of Typhoid Fever. By M. SAINT LAURENT.

TRIALS of the virtues of this remedy have been made at the Hôpital Cochin by M. Blache, who was led to form a conclusion favorable to its employment in cases of typhoid fever. The cases, however, in which it was used were not numerous, and in some of them other remedies were given either before or in connexion with the quinine. M. Broqua of Plaisance, who first introduced this practice, coming to Paris, induced M. Husson to permit some of his patients at the Hôpital Cochin, to be subjected to this mode of treatment, and the results thus obtained are published by M. Laurent.

The dose of the medicine was usually ten centigrammes every hour; sometimes the dose was larger and administered less frequently; and in several instances the patients took more than ʒij in every twenty-four hours for many days together. In thirteen cases no other remedy than the quinine was administered, but though the patients recovered, yet the results do not show any great superiority in this over other methods of treatment. In no instance were the symptoms cut short at once by the quinine, while in several cases the increased headach and thirst, and the greater dryness of the tongue which followed its use were not only of importance in themselves, but rendered the cases more complicated, since it was not easy to tell how far those symptoms were produced by the medicine, or how far they betokened an aggravation of the disease. Of ten patients who had the disease mildly, all recovered but one, whose death M. Laurent attributes, apparently with justice, to the action of the quinine. Of three patients who were attacked by the disease in a severe form, one only recovered, and even he was for some time in a state of great danger owing to hemorrhage from the intestines.

The cases are detailed in full, and are not by any means such as would impress one with a favorable opinion of the treatment proposed by M. Broqua. M. Laurent adds that M. Broqua is accustomed to administer the quinine in cases so slight that the patients would recover even though no treatment at all were adopted, and that if M. Husson had consented to its employment in such cases, the number of reputed cures from the sulphate of quinine would have been far greater.   *Archives Générales. Sept.* 1842.

Report on the Results of Inoculation in Measles.
By Dr. M. Von KATONA, of Borsoder, in Hungary.

IN a very malignant and wide-spread epidemic of measles in the winter of 1841, the author inoculated 1122 persons with a drop of fluid from a vesicle, or with a drop of the tears of a patient with measles. The operation was performed in the same manner as the inoculation for smallpox. It failed in 7 per cent. of those on whom it was tried, but in all the rest it produced the disease in a very mild form, and not one of them died. At first a red areola formed round the puncture, but this soon disappeared: on the seventh day fever set in, with the usual prodromi of measles; on the ninth or tenth the eruption appeared; on the fourteenth desquamation commenced, with decrease of the fever and of the eruption; and by the seventeenth the patients were almost always perfectly well again.   *Oesterreichische Medicinische Wochenschrift. Juli* 16, 1842.

Hairs growing on the Tongue. By Dr. BEER, of Brunn.

THE patient was a medical student, who after complaining for some time of dyspepsia and a *sticky* sensation in the mouth discovered hairs of considerable length grew from his tongue. They were detached in vomiting, but they grew again, and when the author saw him they were an inch long.
                          Oesterreichische Medicinische Wochenschrift. August 13, 1842.

On the Chemical Composition of the Fluid of Ranula. By L. GMELIN.

IT is entirely different from saliva, containing no sulphocyanate, and only a small quantity of salivine, but chiefly albumen. The albumen, however, amounts to only 2 per cent. though the fluid is as thick as others containing about 5 per cent. It is to be supposed, therefore, either that the fluid of ranula contains some peculiar material to which it owes its thickness, or else that the albumen in it is of some peculiar kind.

Repertorium für die ges. Medicin ; from the Annalen der Chemie, 1842, Hft. iii.

The relative Frequency of Tubercles in various Organs. By Dr. ENGEL, of Vienna.

THE proportional frequency of the occurrence of tubercle in the lungs to that of tubercle in the cerebral membranes, the pleura, liver, and spleen, is as 18 to 1 ; to that of tubercle in the brain and kidney as 18 to 2 ; and that of tubercle in the peritoneum and intestines as 18 to 3. This is the more remarkable, when compared with the relative frequency of cancer in the same organs. Cancer of the lungs occurs, in proportion to cancer of the liver, as 18 to 48 ; to cancer of the stomach as 18 to 42 ; to cancer of the intestines and kidneys as 18 to 12 ; and to cancer of the brain, spleen, peritoneum and uterus, as 18 to 18. The frequency of tubercle of the lungs is to that of all other diseases of those organs as 2 to 3.

Canstatt's Jahresbericht, 1842.

A new Method of administering Quinine. By Dr. GUASTAMACCHIA.

THE author's object was to find some method of avoiding the disgust which the bitterness of quinine always excites ; and after repeated trials, he says he found it best to dissolve eight grains of the sulphate in half an ounce of rectified spirit and rub it, in two doses with an interval of a quarter of an hour between them, along the spine. In intermittent fever this should be done at the beginning of the cold fit ; and it very often prevented even a single recurrence of it.

Il Filiatre Sebezio. Agosto, 1841.

Account of an Epidemic of Cerebro-spinal Meningitis, observed at the Medical Clinque of the University of Strasburg. By Professor FORGET.

THE description given by the Professor of this epidemic is so long, extending through several numbers of the Gazette Médicale, that we cannot afford space for more than the brief abstract of it contained in the Gazette des Hôpitaux.

The epidemic which began towards the close of 1840, and continued to prevail until May 1841, was almost exclusively confined to the poorer classes, and no cause could be assigned for its occurrence. Many writers have insisted on the suddenness of the attack, as one of the characteristics of the epidemic: there existed, however, a stage of premonitory symptoms, marked by occasional rigors, slight lassitude, headach, loss of appetite, &c. At the onset of the disease severe pain was felt in the forehead, temples, and occiput. This pain was sometimes constant, at other times it remitted at intervals ; it was of a pulsating or lancinating character, or caused a sensation as though the head were bound with cords, or subjected to pressure, or as though it were being bored, or rent asunder. If the disease continued for any time the headach was succeeded by delirium or coma. It was accompanied by vertigo, confusion of the ideas, and hallucinations of the senses of sight or hearing. Pain in the back was a pathognomonic character of the epidemic. It was more frequently referred to the back of the neck than to the loins, and occasionally it was so severe that patients lay motionless on their back, not daring to move, for fear of exciting it afresh. Opisthotonos was often associated with the pain in the back, as was trismus, in some instances. The brows were knit, the eyes fixed, and risus sardonicus was often observed. There was generally considerable weakness and

pain in the limbs; sometimes there was a condition of general or partial agitation, and subsultus tendinum was frequent in the advanced stages of the disease. In one instance there was a general trembling of the limbs, as in delirium tremens. In some cases there were clonic convulsions, and an epileptic seizure occurred in one instance. Delirium sometimes existed from the beginning, and coma without stupor accompanied or followed the delirium in some instances. Paralysis was rare. The eyes were affected in various ways: the conjunctiva was seldom injected, strabismus was rare, the pupil was sometimes dilated, sometimes contracted, occasionally natural. Optical illusions occurred sometimes, the sight was often obscured, but complete blindness was never noticed. Tinnitus aurium, deafness, and occasionally, deafness and loss of speech occurred in the same person. The face was occasionally turgid, but paleness of the face and integuments were more frequent, and burning heat of the skin was seldom noticed except of the forehead. As death approached the extremities became cold. An extensive eruption of *herpes labialis* was frequent, but did not appear to possess anything of a critical character. The tongue was usually moist and white at the beginning, and afterwards became dry, red, or brownish. As soon as the cerebral symptoms began to abate, the patients felt a desire for food. Thirst was usually not urgent. Vomiting at the commencement of the disease was of constant occurrence, and very severe. The bowels were generally constipated at first, afterwards purged. There was abdominal tenderness, either of the epigastrium, or of one side, usually the right, and as the disease advanced, the belly sometimes became distended and tympanitic. In many cases there was slowness of the pulse, which contrasted with the acute character of the other symptoms, and its beats were irregular. In some instances the bladder was paralysed.

Course of the disease, its *terminations*, its *forms*. In those who did not sink under the onset of the disease, the headach gave place to delirium, which was soon followed by coma. The vomiting ceased, but the pain and stiffness of the spine continued. Sometimes the disease remained stationary at this point so as to give rise to hopes of the patient's recovery. Gradual exhaustion, however, delirium at night, diarrhœa and obstinate vomiting came on, and ushered in the fatal termination.

Post-mortem appearances. The sinuses of the brain were gorged with blood. Sero-albuminous deposits on the parietal layer of the arachnoid, whenever fluid was contained in its cavity. A considerable quantity of sero-purulent fluid was found almost always in the lower part of the spinal canal. The pia mater was always injected, and this injection extended to the spinal marrow through a greater or less extent. On a level with the calamus scriptorius the arachnoid was frequently raised by a turbid serum effused beneath it. In the sub-arachnoid tissue were various deposits, sometimes resembling gelatin, at other times, like concrete albumen, or like true yellow pus, abounding especially about the optic nerves and around the origin of the spinal cord. Pus-globules were detected in this matter by the microscope. No important appearances were found in other organs, and in an anatomical point of view this epidemic presented nothing distinct from what is observed in sporadic meningitis, any more than it did in its symptoms.

Treatment. This consisted in free general depletion, repeated two, three, or four times in the course of two or three days, if the disease seemed to require it. Local depletion, either by leeches or cupping, produces, however, more marked relief than the general abstraction of blood. It appears, too, from the statistics furnished by M. Forget, that the patients who recovered lost more blood than those who died. The employment of calomel led to no good results whatever, but often produced obstinate diarrhœas, or affected the mouth severely. Tartar emetic, employed as a revulsive, did no good. M. Forget at length contented himself with mild laxatives to counteract the constipation. Blisters were frequently employed after or conjointly with depletion.

Febrifuge tonics, as quinine, antispasmodics, and excitants were tried and

found to be injurious; but after the disease had been broken by antiphlogistic measures, many of the nervous symptoms which remained were greatly relieved by the administration of opium.

<div style="text-align: right;">

Gazette Médicale, Avril 9-16-23, *Mai* 7-14, 1842 ;
and Gazette es Hôpitaux, Juin 2, 1842.

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Account of a Disease which affected a large number of Persons in the Canton Zurich, and which was induced by partaking of Decayed Meat. By Dr. SIGG.

On June 10th, 1839, a musical festival was held in the church at Andelfingen, to which persons resorted from all parts of the canton. In the church the air was extremely hot, and the atmosphere out of doors was oppressive, and the clouds were heavy, and threatened a thunder storm. After spending four hours in the church, between 500 and 600 persons sat down in an outhouse, which had been fitted up for the occasion, to a dinner of cold veal, ham, and sallad, with indifferent wine and beer. The meat did not look good, and the ham had such a strong taste that many persons did not partake of it, though most made a hearty meal.

On their way home many were taken ill and vomited; on the following day many more were attacked with nausea, vomiting, and diarrhea, and within a week or ten days, most who had borne a part in the festival became more or less seriously indisposed. Of the 600 persons who had partaken of the dinner, 444, or more than two thirds were attacked between the 10th and 20th of June, of whom nine died with typhoid symptoms.

Those persons who had vomited on their way home from the festival, suffered but little subsequent inconvenience; the others were mostly seized from the 5th to the 10th day after it, with sense of uneasiness and exhaustion, with pains in the limbs and head, slight rigor, loss of appetite, with great thirst, and an extremely unpleasant coppery taste in the mouth. Nausea, with vomiting and diarrhea, were extremely common, and notwithstanding their sense of exhaustion, the patients were unable to sleep, but walked listlessly about, or threw themselves on the ground to rest.

After these symptoms had lasted about seven days, they increased in severity; the fever ran higher, the pains in the head were more distressing, and the patients were compelled to keep their bed. Colic-pains came on in the abdomen, and the epigastric region was frequently extremely tender. At this stage of the disease constipation usually existed, but sometimes diarrhea came on, in which the patients passed six or eight dark-green and highly-offensive evacuations in the twenty-four hours, by which they were greatly exhausted. Delirium often accompanied the evening exacerbations of fever, during which the patients were extremely restless, and often violent, but about the 12th day they usually sank into a torpid state with predominance of the typhoid symptoms while it was only on touching the abdomen that they seemed to be suffering pain. Symptoms of oppression at the chest generally supervened from the 14th to the 17th day, and were attended with cough and slight expectoration. This occurrence seemed to mark the third stage of the disease, and was usually accompanied with the gradual subsidence of the abdominal symptoms. Moisture appeared at the edges of the tongue, the skin began to perspire, and the patients gradually advanced towards convalescence. No discharge occurred which could be called critical, but the cough and fever usually subsided together, leaving the patient in a state of great weakness. In the cases which terminated fatally, the typhoid symptoms of the second stage increased in severity, the abdomen became tympanitic, the stools were horribly offensive, and often mixed with blood, the weakness of the patient became extreme, and fainting-fits were frequent, till death at length took place.

A post-mortem examination was made in four cases. The membranes of the brain were found congested; and a considerable quantity of bloody serum escaped from the cut surface of the lungs. The heart was flabby, but its mus-

cular substance did not appear altered. The most important changes were found in the lower part of the ileum, which was red externally ; and on laying it open the mucous membrane was found of a dark-red colour in patches, very friable, or if the disease were further advanced, presenting patches of ulceration varying in size from that of a mustard seed to a fourpenny-piece.

The writer enters into a long examination of the causes of the disease, far too long to admit of condensation here. It appears, however, to be clearly referrible to the meat of which the persons partook, none having suffered who ate only bread and cheese, or butter, while persons who were not present at the festival, but who partook of the meat at their own homes were affected. The animals appear to have been healthy, and their flesh seems to have been perfectly good when they were first killed, but to have become tainted by being kept for some days, after it was cooked, in an ill-ventilated cellar, while the hams were originally but imperfectly cured.   *Hufeland's Journal. May,* 1841.

Quinine in Asthma. By B. R. HOGAN, Esq. United States.

THE author asserts that quinine, administered in doses of from two to eight grains, repeated in an hour, if relief does not follow, has cured every case of asthma in which he has tried it. He was induced to try it in asthma, in consequence of its known efficacy in all paroxysmal and congestive diseases. He also alleges that in the " forming stage" of croup, in the case of a child, two years old, a couple of grains of quinine, and a " snuff" plaster on the chest, warded off the attack.   *American Medical Intelligencer. No.* viii. *Feb.* 1842.

SURGERY.

On the Treatment of small Nævi in Children, with Acetum Lithargyri. By Dr. SIGMUND.

THE author informs us that after the employment of a variety of remedies he finds acetum lithargyri the most powerful in causing to shrink and disappear those vascular growths in children, when the growth does not exceed the size of a hazel nut. This disease attacks the face chiefly ; the upper lip more particularly : an operation for its removal is apt to cause great disfigurement ; and the method of acupuncture recommended by Lallemand, and compression, seldom prove successful. For small, nonpulsating tumours of this description, the acetum lithargyri, used as a cold fomentation, or applied in small compresses, renewed twice a day, will be found highly useful. It causes a separation of the epidermis, which cracks and falls off ; and the newly exposed surface is to be treated as the layer just removed. In four weeks, by this method, the author has succeeded in removing small nævi.

Oesterreich. Medicin. Wochenschrift. No. xix, *Mai* 7, 1842.

Analysis of a Calculus removed by Operation from the Lachrymal Canal. By M. BOUCHARDAT.

THE calculus occurred in a lady aged sixty-six, who had always been healthy, with the exception of some slight attacks of gout, which had left small concretions on the joints of the toes and fingers.

The calculus weighed 4-10ths of a grain, and yielded on analysis :

Concrete albuminous matter	25 Parts.
Mucous matter	18
Fat	A trace.
Carbonate of lime	48
Phosphate of lime and magnesia	9
Chloride of sodium	A trace.

Annales d'Oculistique. Juillet, 1842.

On Strabismus. By M. VELPEAU.

FROM this long essay the following statistics alone admit of extract. Of 300 cases on which M. Velpeau has operated, and which have been since watched, he has found that, in half, the remedy was so complete that, except by looking close, it could not have been said that the patient had ever squinted. In the other half, one third was benefited in various degrees, but there was some visible deviation of the eye from its proper axis. In the remaining two thirds of this half, or in one third of the whole, the operation was absolutely unsuccessful; that is, the eye either retained its whole deviation, or had moved too far in the opposite direction, or was turned upwards or downwards, or there was exophthalmia, or immobility of the eye, or some grave defect. Many of these cases M. Velpeau believes owed their ill result to want of attention to his rules after the operation: but the public, he says, had heard so much of the simplicity and certainty of the operation, that it was impossible to persuade them to be cautious.

In 128 of his cases, tabulated by M. Gouraincourt, there were

Convergent strabismus in   111
        Of these 17 were double,
              67 on the right side,
              27 on the left.

Divergent strabismus in   17
        Of these 7 on the left side,
              10 on the right.

In another set of 138 cases, there were
Convergent   123
        Double   .   .   . 20
        Right   .   .   . 52
        Left   51
Divergent 15
        Double   .   .   . 2
        Right   .   .   . 8
        Left   .   .   . 5

In another set of 45 cases there were
Convergent   35
Divergent   10
        Right side   .   . 22
        Left   23

Annales de la Chirurgie.   *Mai,* 1842.

Statistical Studies on the Results of the Capital Operations in the Hospitals of Paris. By M. MALGAIGNE.

THIS is an excellent paper in the style in which M. Malgaigne is so usually successful, that he would do well to adopt it always in preference to that flippant strain in which he has of late been writing on medical history. After pointing out the improbabilities of the notions commonly entertained respecting the small mortality of amputations performed by certain surgeons (especially Percy and Dupuytren), he proceeds to the statistical analysis of all the amputations performed in Paris from the 1st of January 1836, to the same day in 1841, and of which the total number was 852. We shall follow him in as brief an abstract as will convey the important facts of his analysis, dividing the 852 amputations according to the situations at which they were performed.

Amputation at the hip-joint, 1 case, which ended fatally.

Amputation of the thigh, 201 cases, of which 126, or nearly 2-3ds, died. Of these 201, 46 were performed for injuries, and 34, or 3-4ths, died; 153 were performed for chronic diseases, and 92, or 3-5ths, died. In one case the amputa-

tion was performed on both sides, and the patient recovered. Of the same 153 operated on for diseases, 115 were males, and of these 64 per cent. died; 38 were females, and 53 per cent. died; 24 were between 5 and 15 years old, and 8 of them died; 90 were between 15 and 35 years old, and 52 of them died; 39 were between 35 and 70 years old, and 32 of them died. On the other hand, of the 46 operated on for injuries, 4 were between 5 and 15 years old, and all died; 26 were between 15 and 35, and 18 of them died; and 16 were between 35 and 70, and of these 12 died.

Amputation of the knee-joint. Of 9 patients on whom this operation was performed, 7 died. Of 14 cases formerly recorded, M. Velpeau had found only 1 fatal!

Amputations of the leg. The total number was 192, of which 106, or about 55 per cent. were fatal. For diseases, 113 were performed, and 55, or half, were fatal; for injuries 79, of which 50, or nearly 2-3ds, were fatal. The patients were 80 males, of whom 46 per cent. died; and 32 females, of whom 56 per cent. died, when the amputation was performed for diseases; while of those who had received injuries there were 67 men, of whom 62 per cent. died; and 12 women, of whom 66 per cent. died. Of the former class also, there were 21 between 2 and 15 years old, of whom 5 died; 48 between 15 and 35 years old, of whom 25 died; and 43 between 35 and 76, of whom 25 died; while of the latter class (who had suffered injuries), 4 were between 2 and 15, and 3 died; 35 were between 15 and 35, and 19 died; and 40 were between 35 and 76 years old, of whom 28 died.

Partial amputations of the foot. Of 38 cases, 9 were fatal, or 24 per cent.; of these, 29 were performed for chronic diseases, and only 3 were fatal; while of the other 9 performed for injuries, 6 were fatal. Of the 29 patients, 20 were under 35 years old, and all recovered; 9 were upwards of 35, and 3 died. Of the 9 who had received injuries, 4 were between 27 and 37 years old, of whom 1 died; and 5 were between 35 and 58 years old, and all these died.

Amputation at the shoulder-joint. There were 14 of these performed in the five years. One patient had his thigh amputated at the same time and died. Of the remaining 13, 10 died; 7 of these had received injuries, and all died.

Amputation of the upper arm was performed 91 times, and there were 41 deaths, or about 45 per cent. In 61 of the patients there had been previous disease, and of these, 24 or 2-5ths died; the 30 others had received injuries, and of these 17, or more than half, died. Of the 61, 9 were between 4 and 15 years old, and 3 died; 34 were between 15 and 35 years old, and 13 died; 18 between 35 and 80 years old, and 8 died; while of the 30 injured patients, 1 was between 5 and 15, and died; 10 were between 15 and 35, and 7 died; and 19 were between 35 and 84 years old, and 9 died.

Amputation of the forearm. 28 were performed, and 8, or 28 per cent., were fatal. Of the whole number of patients, 17 had had disease below the amputation, and 5 died; 11 had received injuries, and 3 died. As to age, 3 of the diseased were between 5 and 15, and 1 died; 4 were between 15 and 35, and 1 died; 10 were between 35 and 70, and 3 died; while of the injured, 1 was 8 years old and recovered; 3 were between 15 and 35 and all recovered; 7 were between 35 and 70, and 3 died.

Amputation at the wrist-joint was performed 16 times, and all the patients recovered; 4 of the patients were women and 12 were men; 4 had been injured and 12 diseased; their ages varied from 11 to 65. Of all the great amputations, therefore, this was least fatal.

Amputation through one or more of the metatarsal bones was performed 8 times (exclusive of venesection and extirpations), and 1 patient, a man who had received an injury of the toe, died. *A metacarpal bone* was amputated 9 times, and 1 patient, a man æt. 22, who had had disease of the part removed, died. *Amputation of the great toe* by disarticulation was performed 43 times, and 7 of the patients, or 1-6th, died. Of the whole number, 29 had disease of the toe, and only 3 died; while of the 14 who had received injuries of it, 4 died. All

those who died were men; 5 women recovered. Of the *pathological* amputations, 2 were performed on patients between 5 and 15 years old, and both recovered; 18 were between 15 and 35, and 1 died; 9 were between 35 and 70, and 2 died; while of the *traumatic* cases, 6 patients were between 15 and 35, of whom 1 died; and 8 were between 35 and 70, of whom 3 died.   *Amputation of one of the smaller toes* was performed 26 times, 12 of the operations being for injuries, and 1 patient, a man 40 years old, with disease of the toe, died.   *Amputation of several toes* at once was performed 7 times, and there was 1 death. *Amputation of the phalanges* was in 9 cases successful, in none fatal.

Amputation of the thumb was fatal in 3 cases out of 9, all the 3 operations having been performed for injuries.   *Fingers* were amputated singly 119 times, and in 10 cases death followed; namely, in 6 out of 79 pathological cases; and in 4 out of 40 traumatic cases.   *Several fingers* at once were amputated 13 times, and death ensued in 1 case.   *Phalanges* were amputated 24 times, and death ensued once.

The general results of these statistics may now be briefly summed up.   Amputations after injuries are more frequently fatal than those performed for chronic diseases.   The mortality of the former is 64 per cent. in the greater, and 15 per cent. in the minor amputations; that of the latter is 48 per cent. in the greater, and $7\frac{1}{2}$ per cent. in the minor.

After injuries, M. Malgaigne has found that of 49 immediate amputations, 34 were fatal; and of 20 secondary amputations, 13.

Females recover from amputations more often than males.   The proportionate mortality after great amputations is for males 55 per cent., for females 47 per cent.; and after minor amputations, for males $12\frac{1}{4}$, for females 4 per cent. About the same ratio holds whether the amputation be performed for injury or for disease.

For the influence of age, nearly the most unfavorable period is that of infancy; from 5 to 15 years of age the mortality is less, and this is, on the whole, the most favorable period for both sexes; beyond this age the mortality gradually increases, and more rapidly in women than in men; from 50 to 65 is the most unfavorable period for both sexes; but after 65 the mortality seems to decrease.

In the different seasons, the mortality increases in the following order, winter, summer, spring, autumn: in the first it was (in the cases analysed, which were all great amputations), less than 50 per cent.; in the last about 55 per cent. Slight variations are found according to the classes of cases analysed, but the same general order is maintained, except in the case of patients from 15 to 20 years old, to whom the winter is the most destructive season, and then autumn, summer, and spring successively.

An analysis is lastly attempted in order to determine the comparative ratio of mortality in each of the chief Parisian hospitals; but its results are not definite.
<p align="right">*Archives Générales de Médecine.   Avril et Mai*, 1842.</p>

On the Fractures of the Lower End of the Radius.   By M. VOILLEMIER.

THE chief object of this very excellent paper is to prove, especially by examination after death, the direction which fractures of this kind usually take, and thence to deduce the best method of treating them.   The difficulty and importance of the question is sufficiently proved by the number of essays which have been recently published upon it.   We can only abstract the peculiar portions of the author's views.

As the basis of these he points out some facts in the structure of the radius, namely, the double inclination of its inferior articular surface, which is oblique from above downwards and from before backwards, and from within outwards; its prominent border behind and on the outer side; and, above all, the thinness of the compact tissue of the lower extremity of the radius, when compared with that of the shaft, the former becoming suddenly almost as thin as paper, while the latter is so thick that there is scarcely any medullary tube.   It is from this

last circumstance that there results both the peculiar tendency to fracture near the wrist, and the position in which, according to M. Voillemier, the fragments are usually placed, and which is such that the fracture may be called *fracture by penetration*.

In a fall on the hand (the most frequent cause of this fracture), all the force of the shock is transmitted to the radius, and it breaks at its weakest point, where the compact tissue is thinnest, and *that* is just above the wrist-joint. At this part, too, the cancellous tissue is first abundant ; the compact tissue of the wall of the upper portion is therefore, by the continuance of the force after the fracture has taken place, driven into the cancellous tissue of the lower. This penetration may take place in several ways. If the extremity of the bone is large, and the force has been transmitted in nearly the direction of its axis, and all parts of the wall have yielded almost simultaneously, the whole of the end of the superior fragment may be driven into the lower one, and the two pieces may be thus locked or *nailed* one within the other. When, in such a case, the force is very great, the upper fragment may be so driven into the lower, that the latter may be completely smashed ; it was to cases like this that Dupuytren gave the name of *fractures par ecrasement*.

But this mode of fracture, as might be expected from the number of circumstances which must combine to produce it, is rare ; the more common form is produced when the force of the fall comes somewhat obliquely upon the radius. In this case, the line of fracture is, as in the last, nearly parallel to the plane of the articular surface, but since the force falls more on the posterior than on the anterior part of the latter, it follows that the posterior edge of the fractured compact tissue of the upper fragment begins first to penetrate into the cancellous tissue of the lower, and that the anterior edge, instead of penetrating, slides over upon the dorsal surface of the lower or carpal fragment. There is thus a dovetailing or reciprocal penetration of the two portions. And a similar arrangement of parts is seen, whether one traces them from behind forwards, or from without inwards. In the former direction, one comes first on the dorsal portion of the upper fragment, then on the same portion of the lower fragment, and then, in the same succession, on their palmar portions ; and in the latter direction there is, on the outside the outer margin of the lower portion, then the outer margin of the upper one, and so on ; for the outer edge of the upper portion in these cases always penetrates the cancellous tissue of the lower in such a manner that, if the line of its wall were carried on, it would cut off the styloid process. Hence it is that in all the cases of fracture of the radius near the wrist which M. Voillemier has examined long after the accident, he has found on a vertical section of the bone, a line of compact tissue continued straight downwards from the outer wall of the shaft into the interior of the cancellous tissue of the head. There are not two such lines of compact tissue, because that of the lower portion which should penetrate into the upper, is usually broken up and absorbed, in consequence of its extreme thinness.

Having found this state of parts in the great majority of instances, M. Voillemier denies the existence of oblique fractures of the lower end of the radius, and of those especially which M. Diday had described as fractures " taillés en biseau." These, he says, have been supposed to exist in consequence of the sensation which fragments, placed as described above, give when examined during life. The dorsal edge of the upper fragment projects somewhat lower down than the palmar edge of the lower one, for the former is pushed downwards over the lower fragment, the latter upwards over the upper one ; and hence it seems to the touch as if the line of fracture were oblique from the palmar to the dorsal surface, and from above downwards. But such a state of parts has never been found on dissection. The condition is analogous in those rarer cases in which the lower fragment passes, not towards the dorsal but towards the palmar aspect of the upper one. Here there is only a seemingly oblique direction of the fracture, in consequence of the projecting edge of one fragment being higher up than that of the other.

From these pathological facts, which we believe to be exactly conformed to the truth, M. Voillemier gives a clear *rationale* of the symptoms, and then deduces the mode of treatment best to be followed. The chief feature of that which he recommends is its simplicity, but he, without doubt, asserts a true principle when he says that in these fractures, even more than in most others, the apparatus must be adapted differently to almost every case.

An important addition to this paper is that part in which M. Voillemier speaks of the separation of the inferior epiphysis of the radius which may take place in consequence of severely twisting the wrist-joint. He was led to notice this, by having accidentally produced it in an attempt to dislocate the wrist of a dead body; and he subsequently convinced himself that either this separation, or a fracture of the lower end of the radius, without complete rupture of the surrounding fibrous tissues, might be thus produced during life. He relates two cases in which he believes it had occurred, and points out, as its chief signs, the absence of deformity where all the other characters of fracture are present, and a most severe pain at the ordinary situation of the boundary between the epiphysis and shaft, whenever any attempt at motion is made.

Archives Générales de Médecin.   Mars, 1842.

On Extirpation of the Eye.   By Dr. Bonnet, of Lyons.

The attention lately paid to the orbital capsule of Tenon, has led Dr. Bonnet to an improved method of extirpating the eye, in those cases in which nothing but the eyeball requires to be removed. In the ordinary mode of operating, the instrument is buried in the fat of the orbit, and the muscles are divided at a considerable distance from their insertion into the eyeball; the trunks of the nerves are cut across, as well as considerable branches of the ophthalmic artery. All this is avoided, if the muscles and the optic nerve are divided at their insertion into the sclerotica, and the eyeball removed, leaving Tenon's capsule entire. In this mode of operating, all risk of hemorrhage is avoided, the optic nerve only is divided, and the wound is separated from the remaining contents of the orbit by the capsule. Separating the eyelids, Dr. Bonnet proposes to divide the rectus internus, as in the operation for strabismus; next, sliding the scissors through the wound, they are to pass between the sclerotica on the one side, and the subconjunctival fascia and muscles on the other, and to divide the remaining three recti close to their insertions; the two obliqui are to be divided as near as possible to the eye; then, the optic nerve. The eye is now removed, without implicating any vessel, or any other nerve than the optic, and without penetrating into the fat of the orbit.

The cases suitable for this mode of operating must be few, the textures surrounding the eyeball being in general too much implicated in the disease to be left behind. Gensoul had a case, in which Bonnet's plan might have sufficed. The eye was changed neither in form nor size; vision was destroyed; but the excruciating pain suffered by the patient, and which no means were found to mitigate, was the only circumstance which determined the question as to an operation. A melanotic tumour, confined to the retina, was found to be the disease.

Dr. Stœber, of Strasburg, has removed an eye affected with melanosis, nearly on Bonnet's plan. Having cut the rectus internus, he drew the eye forwards, divided the optic nerve with curved scissors, and finished the operation by separating from the eye the conjunctiva and the muscles. The eye, thus removed, looked as if nicely dissected, the sclerotica being perfectly free of cellular substance. The operation required much less time than the ordinary extirpation, and very little blood was lost. Dr. Cunier has removed an eye according to the same method. The eyeball was not changed in form; the disease was medullary fungus. The suppuration was very great, and the granulations excessive. Experience must determine, whether these effects are generally to be expected when this mode of operating is adopted.

Annales d'Oculistique.   Avril, 1842.

Removal of a whole Rib. By Signor METAXA, of Rome.

THIS operation was performed for necrosis, which had long existed, and had originated in a wound, with violence inflicted on the tenth rib. There had been reducing suppuration, and the author had proposed to remove a portion only of the rib, but he found that the necrosis extended so much further than he expected, that he was obliged to disarticulate the head of the rib from its connexion with the vertebra. The patient quickly and completely recovered.

Annali Medico-Chirurgici. Aprile, 1842.

Vaccination and Revaccination. By Dr. AXISA, of Malta.

GREAT difficulty having been experienced in maintaining a supply of good vaccine lymph in Malta, Dr. Axisa was commissioned to make experiments to discover if vaccine lymph inoculated in the cow was reproduced; and if so, whether it maintained its salutary properties. In this inquiry the Doctor was assisted by a medical committee. He performed his first experiment 15th June, 1841. With lymph from the pustules of a healthy girl two years of age, who had been vaccinated seven days, he inoculated the udder of a cow in thirteen points. On the 9th there was a distinct areola around each spot; 11th, pustules full of lymph, and circumscribed by an areola, livid red, tense, and swollen. On the 13th the pustules were examined by a number of physicians, who all agreed that they were the true vacciniæ, the areola however being wanting, which Dr. Axisa says disappeared that day.

A pustule was opened. It contained liquid lymph, with which ten children were vaccinated on the same day. 16th, the pustules on the cow had desiccated. Of the ten children inoculated only two had the vaccine *eruption, all had a single pustule*, and in one the pustule was well developed. On the 8th day, and with the pus from this pustule another cow was vaccinated in sixteen points, and on the same day with the same matter a child three months old. On June 22 the pustules of the first two boys were flat, umbilicated, and surrounded by their respective areolæ. On the 28th, the pustules of the second cow, and of the child inoculated on the 21st, were undeveloped and areolated. Five children were inoculated with the matter from these pustules, and one of them with this matter in one arm, and in the other arm with that of the pustules of the boy inoculated at the same time with the second cow. On July 6th, the pustules in all were well developed, and in one there was the vaccine eruption.

Il Filocamo. Febbrajo 15, 1842.

New Mode of Extraction of Cataract. By Dr. BONNET, of Lyons.

HE lays the patient on his back. If it is the left eye, he places himself at the patient's right side, and having applied the elevator and depressor to the eyelids, intrusts them to two assistants, who must see that they do not press upon the eyeball. With his left hand, the operator holds a common pair of forceps; with his right, a hooked spring pair. With the former, he raises the conjunctiva into a fold, and with the latter takes firm hold of that membrane, and of the subconjunctival fascia about one sixth of an inch from the cornea, a little above the external angle of the eyelids. This forceps is then intrusted to the assistant who supports the upper eyelid; it fixes the eye and prevents it from rolling inwards. This operator now takes the depressor of the lower lid into his left hand, and with the right uses the knife to divide the cornea.

To the mode of fixing the eye, above explained, he ascribes the promptitude, precision, and facility, with which the section is accomplished. The incision is always parallel to the edge of the cornea; the iris is never wounded: the operation is as simple, he says, as bleeding: no dangerous consequences ever arise from the pinching of the conjunctiva with the forceps; the specula applied to the eyelids prevent pressure on the eyeball, and that dangerous expulsion of vitreous humour which is apt to happen when the fingers are employed to fix the eye and separate the eyelids! All this we owe to the operation for strabismus!

Dr. Pétrequin employs Bonnet's method of fixing the eye, in the operations of displacement, and in those for artificial pupil.

Annales d'Oculistique. Avril, 1842.

Cure of Asthenic Amaurosis by the use of Convex Spectacles.

TAKING a hint from certain quack vendors of spectacles, Dr. Cunier of Brussels has made trial of the effects of convex glasses, in what he terms *cases of simple anæsthesia of the retina*, and with a considerable share of success. The influence of the light, directed upon the retina by such glasses, appears beneficially to excite the sunken sensibility of the optic nerve.

A lady, whose case he relates, could not for eight years without difficulty distinguish with her left eye the large characters forming the title of a newspaper; could not tell the hour on the clock, unless her eye was within two inches of the hands, nor distinguish the feature nor the figure of a person at the distance of two feet. If the right eye was covered, the left pupil became dilated, and remained so.

Glasses, whether concave or convex, ought always to be distinguished by their focal lengths, and not by numbers. As Dr. Cunier employs the latter mode, we are at a loss to know the precise power of No. 3, with which the patient could read a large type with her left eye, but probably it was a convex lens of three inches focus. After exercising the eye with this lens for some minutes, vision became confused and the head painful, so that the patient was obliged to desist. Next day she could read with No. 3½, and on the third day with No. 4. The duration of this kind of exercise was gradually lengthened, and glasses of longer and longer focus employed. By the tenth day, the patient read the hour on the clock at the distance of 22 inches, and recognized individuals at double that distance. By the seventeenth day of the treatment, No. 24 was employed, and the patient could read small type. After two months' use of No. 24, the sight of the left eye was as good as that of the right.

Several other successful cases are related by Dr. Cunier.

Annales d'Oculistique.   Mai, 1842.

Cases of Hepatic Abscess Explored and Punctured.

IN our 23d Number, (p. 89 et seq.), we have referred to exploratory puncture of the liver, and expressed our opinion as to the manner and circumstances in which the operation is to be performed. We find that this method of treating hepatic abscess appears to gain ground with our medical brethren in the east; and that, to use the words of the editors of the Madras Quarterly Medical Journal, " it offers almost the only chance which remains for the patient suffering under liver abscess." (vol. iii. p. 394.) The operation itself, when skilfully performed, appearing to be devoid of danger, and to lead to no bad consequences, nor to aggravate, in any manner, the circumstances of the patient, is not only as justifiable as any other surgical operation, but seems to be imperatively indicated, in all cases in which abscess is suspected, and its site can be guessed at.

Private Squires, aged twenty-five, was admitted to hospital on the 6th of April, 1840, with acute pain in the right hypochondrium, increased by either pressure or full inspiration. He was treated with purgatives, mercurials, and blisters, but without success; for on the 28th, a tumour presented itself posteriorly in the lumbar region. On the 1st of June, the exploratory needle was passed into the tumour, and on pus flowing, a trocar was introduced, which gave vent to ten ounces of healthy matter, to the great relief of the patient. The canula was retained, and in the course of the afternoon, ten ounces more were discharged. The wound continued to discharge, though slightly, until the 26th, and on the 21st of August, the man was discharged to duty, cured.

In the next case, the explorator was passed twice, without matter being detected, but without any bad consequences resulting from the operation. But the man died, and on examination, two large distinct abscesses were detected in the right lobe of the liver, and three small ones in the left.

The operation, as we have already said, seems to be a perfectly safe one, effusion into the abdomen never taking place in consequence of it. The follow-

ing is an account of the appearances, on post-mortem inspection, of a case in which deputy-inspector Murray successfully explored and punctured an hepatic abscess : the man recovering from the liver affection, and dying, two years subsequently, from dysentery.

"On dividing the muscles of the belly, the liver appeared larger than usual, and of rather a darker colour : there were no adhesions to any part of the abdominal parietes, except at the point where the puncture had been made ; and at this spot it appeared as if it was attached to the walls of the abdomen, or rather hung from it by a cord, about the size of a small goose quill. On dividing its substance minutely, not the slightest vestige of the sac of an abscess could be found, or anything that would indicate such having existed."

Madras Quarterly Medical Journal.   Vol. iii.

MIDWIFERY, AND DISEASES OF WOMEN AND CHILDREN.

Operation of Pelviotomy.   By Dr. IPPOLITO.

THIS operation was performed in the Ospedale degl'Incurabili.   The patient was twenty-three years old, and rickety ; she was nine months pregnant, and three days before her admission, the liquor amnii had escaped after slight pains which had continued ever since.   The pelvis, measured with a Baudelocque's pelvimeter, had a sacro-pubic diameter of three inches, but the base of the sacrum was much inclined to the left, so that the distance from it to the ilio-pubic symphysis of the same side was not more than one inch, and the whole left half of the cavity of the pelvis was entirely useless for parturition. The head presented, but the os uteri, after four days' pains, was scarcely enough dilated to admit a finger.   After a consultation of all the professors, it was determined to perform pelviotomy according to the method of Professor Galbiati, who was himself present.   He would have waited till the os uteri was somewhat dilated in order that directly after the operation the fœtus might be extracted alive by the forceps, or by turning ; but the others were for immediately operating.

Dr. Ippolito therefore proceeded at once to the operation.   It was long but well borne, and not an ounce of blood was lost.   [The details are not given ; but we gather that the bodies of the ossa pubis, and the ascending rami of the ischia were cut through with strong-toothed forceps.]   After the operation the patient was put in a warm bath, and some anodyne medicine was given, which refreshed her. In the following night the labour-pains increased, and in the morning they were powerful ; but the orifice of the uterus was not much dilated.   Ten grains of ergot of rye were given ; then a tepid bath, and then another dose of the ergot. The pains were thus increased, and became very frequent, and a little before noon a well-nourished and large child was born ; but though it had given distinct signs of life while in the perineal space, it was now asphyxiated and could not be recovered.

After the birth the mother's pulse, which had been small and contracted, rose, and some hours after she had fever with a tendency to vomit ; but after a calming draught she passed the whole night quietly.   On the following day she had slight fever, the uterus was contracted and without pain, the lochia regular, the abdomen soft and without pain ; only she complained of a pain in the right iliac region.   A bath gave some ease, and castor oil was administered with effect.   All the rest of the day she had flatulence and eructation with tendency to sleep and slight fever.   On the morning of the second day after the operation she was better, and had had several evacuations from the bowels : the pulse was eighty-four ; the tendency to vomiting and the sleepiness had ceased ; the abdomen remained soft.   A bath and magnesia-water were prescribed. On the third day the abdomen was tense and there was meteorism ; the pulse was ninety-two.   Twenty leeches were applied to the hypogastrium, and other

means were employed with some temporary relief, but next day she was much weaker, and the peritonitis had increased. She died on the sixth day after the operation.

At the autopsy, the wounds were found gangrenous. There were spots of ecchymoisis on the outer part of the uterus, with a purulent albuminous fluid, opposite the wounds through the pubis. The uterus was of the size usual in that period after parturition: there was some redness with a little purulent effusion around the right round ligament. All the peritoneum was reddened; the intestines and other organs were natural; the mucous membrane of the uterus was as if gangrenous, its parenchyma healthy but congested. There was slight purulent effusion in the iliac fossa.

The reporter, a pupil of Prof. Galbiati, remarks, that the operation might have been shortened by using a chain-saw instead of the forceps for cutting through the bones: and that it was performed too soon. By waiting till the os uteri was dilated, the patient, weakened by the operation, would have been spared about twenty hours' labour-pains.

Il Filiatre Sebezio. Marzo, 1842.

Account of a Case in which an extraordinary number of Worms was voided by a Child. By Dr. GILLI, of Turin.

A BOY, the child of healthy parents, always had good health till he was weaned when fourteen months old. Soon after this period he had an attack of gastro-enteritis, which yielded, however, to antiphlogistic treatment, but was followed by the formation of a large abscess in the left axillary region. His illness appeared to have been in great measure induced by unwholesome food which his nurse had given him, and after his recovery his parents were surprised to see that though in other respects well he yet devoured with avidity, earth, chalk, and other indigestible substances. He was now eighteen months old, when symptoms of gastro-enteritis reappeared, for which local depletion and other antiphlogistic measures were had recourse to. Under this treatment the abdomen had become soft and the constipated bowels had begun to act, when suddenly the belly again grew tense and painful, and colic-pains came on with such violence, that the patient threw himself out of his cot and rolled in agony on the floor. He demanded food incessantly, and devoured whatever was given him. The eyes during this time were fixed, the pupils dilated, the tongue was red and loaded, and the breath fetid. With this was associated considerable disturbance of the nervous system with frequent convulsive movements of the limbs and twitchings of the muscles of the face. Fomentations were applied to the abdomen and vermifuge medicines were given. On the first day of their employment the patient voided twelve lumbrici. The symptoms continued unabated on the following day, the same remedies were persevered in with the addition of an enema, which produced the discharge of a great number of worms and manifest relief of the symptoms. Many of the symptoms, however, continued, and vermifuge remedies were accordingly persevered with, and with such effect that in the space of eight days 510 worms were discharged, some alive, others dead, most of them about six inches in length. Some of these worms were vomitted, but by far the greater number were discharged by stool, and the little patient was so exhausted by his efforts to get rid of them, that they were extracted as often as they made their appearance at the anus. At the end of eight days no more worms were passed, and the child rapidly recovered his health.

Giornale delle Scienze Mediche di Torino. Marzo, 1842.

On Abdominal Apoplexy in New-born Children. By Dr. FR. VON KIWISCH, of Prague.

THIS name is applied by the writer to a number of affections which are unnoticed by many writers, and by others are classed, though improperly, under

the head of hæmatemesis, melæna, &c. The writer has observed apoplexy of the intestinal canal four times, and of the liver twice, as sole cause of death, and has observed it several times in the liver and once in the spleen in connexion with other diseases.

In the four cases of apoplexy of the intestinal canal, the children had attained the full term, and were born after easy labours. In two the umbilical cord was tied too soon, and in one it was found necessary to untie the cord, and to allow the escape of blood from it before respiration could be properly established. Within a few hours after birth, from twelve to thirty, the first symptoms of the disease appeared, the children discharging blood from the anus, and in two instances they likewise vomited it. The abdomen became distended and dull on percussion, the children, who at first were restless, grew by degrees quiet and pale, and they all died within forty-eight hours after birth with the signs of exhaustion from hemorrhage. After death all the organs were found remarkably bloodless, with the exception of the intestines and stomach, which contained a considerable quantity of blood. The effusion seemed to have taken place originally about the middle of the ileum, for here the blood was most completely infiltrated into the intestinal walls. The cause of this as well as of the other forms of abdominal apoplexy seems to be the tying the umbilical cord before the respiration is completely established. Whenever in a new-born child lividity of the body appears, the funis must at once be untied and blood allowed to escape.

The cases of apoplexy of the liver were marked by the children becoming restless and refusing the breast. On the following day the abdomen began to swell, and on the third day the children died. In one instance a considerable quantity of grumous blood was found in the abdominal cavity, the right lobe of the liver was much distended, and the peritoneum investing its lower surface formed a fluctuating pouch, in the middle of which was a laceration four lines in length, that gave exit to a considerable quantity of fluid blood. This sac was full of blood and softened liver, but elsewhere the substance of the organ was of natural consistence. In slighter cases there were merely slight extravasations of blood beneath the peritoneum, but not the substance of the liver.

The author only once met with splenic apoplexy, in connexion with a pneumonia, which proved fatal. In this instance the extravasation was seated in the lower part of the spleen where the parenchyma of the organ was quite broken down; its tissue elsewhere was healthy.

Oesterreich. Medicinische Wochenschrift, 1842. Nos. iv. & v.

History of the Epidemic of Croup which prevailed in 1840 and at the beginning of 1841, in the Hôpital des Enfans, at Paris. By M. E. BOUDET, formerly interne of the Hospital.

THE essay (which has been crowned by the faculty of medicine,) begins with a brief historical sketch of the various epidemics of croup of which authors have made mention. They may for the most part be referred to the class either of simple croup limited to the air-passages,—of croup attended with angina and membranous exudations,—or of croup accompanying exanthematous fevers, while a fourth division may include those epidemics of which the accounts in these respects are defective. It appears that croup, when epidemic, has usually coexisted with angina and membranous exudations; that once it was associated with gangrene of the pharynx; that it has but seldom accompanied the exanthemata; and that in some instances its primary seat has been in the air-passages.

A review of the cases of croup at the children's hospital from 1820 to 1839, follows next. It appears that the cases have been most numerous in the autumn months, least so in the spring, while their frequency has been just the same in summer as in winter. The age from two to five years is the most liable to the disease, and it occurs more frequently in boys than in girls. Nineteen of twenty-two subjects examined after death presented a false membrane in their

air-passages, which extended into the bronchi, in seven cases, and to the pharynx only in two.

Such are the chief results afforded by the cases of sporadic croup observed during nineteen years. The number of cases which occurred during 1840 and the early part of 1841 was thirty-six, and the description of this epidemic forms the especial object of the paper.

The unusual prevalence of croup in 1840 was not confined to the Hôpital des Enfans Malades, but was likewise observed in the Hospice des Enfans Trouvés, as well as in private houses in Paris and at Montmartre. The first case of croup in the hospital in 1840, appeared in the month of March, the weather being cold, and the wind northerly. In the following three months four cases of croup occurred; four likewise in the succeeding three months; but in the last quarter of 1840, sixteen cases were admitted. The epidemic did not altogether cease at the close of 1840, but cases continued to occur during the following year. It was remarkable, however, that in no instance did the disease appear in an uncomplicated form, as it had done in the previous year, but always either accompanied or followed diphtheritis. Angina, with formation of false membranes, increased in frequency as the spring advanced, and became associated, in May, with a tendency to gangrene not only of the tonsils, but also of any part from which the skin had been removed by a blister, or sinapism. Croup now became more seldom, but again reappeared in June and July, and did not cease finally until towards the end of 1841.

The instances in which croup appeared wholly devoid of all complication were only four in number; usually it came on in the course of an exanthematous fever, or followed soon afterwards, or it succeeded to a pseudo-membranous angina, or was complicated with gangrene of the skin or the pharynx. The symptoms did not present any important variation from those usually observed, but the post-mortem appearances are described with a minuteness which renders the details very valuable. False membranes existed in some part of the air-passages, in twenty out of twenty-three fatal cases. They were found in the trachea quite as often as in the larynx, but were always thicker and more developed in the latter. In rather less than half of the cases they extended into the bronchi, and in one instance they occupied the bronchi alone, and did not exist in the larynx or trachea. The subjacent mucous membrane usually presented a bright red colour, but without any considerable softening or thickening. In two instances the mucous membrane in contact with the false membrane was ulcerated, and in one of these cases there existed likewise several small collections of pus in the submucous cellular tissue. Whenever croup had not proved very speedily fatal, emphysema, both vesicular and interlobular, was found after death, and usually in a degree exactly proportioned to the mechanical obstacles to respiration. Both lungs were almost always found to be inflamed, but the pneumonia was not usually extensive, seldom occupying more than the base and posterior half of one lobe. In no instance did M. Boudet find the lung in a state of purulent infiltration, and in many cases the pneumonia had not passed beyond the first stage.

The mortality of croup is very variously estimated by different writers, and the discrepancies between their statements are so great that one can hardly avoid the supposition that some essential difference must have existed between the diseases they observed. The late epidemic at Paris has been peculiarly fatal. Of twenty-five children received into the children's hospital labouring under croup, in the year 1840, twenty-three died, and of twelve received during the first six months of 1841 all died, or, in other words, the proportion of deaths has been about three times as great in 1840 and 1841, as in former years. In the city of Paris too there was a striking increase in the number of deaths from croup. The number who died from croup in 1838 was 187,

<div style="text-align:center">

1839 286,

1840.... 326.

</div>

The epidemic croup of 1840 coincided with an unusual prevalence of exanthe-

matous fevers, raging as they became more frequent and subsiding with their decline; till, on the supervention of a pseudo-membranous angina in Jan. 1841, croup was again reexcited. It did not appear as it is usually stated to do at a time when bronchitis, pneumonia, and catarrhal affections, are particularly prevalent, but the very opposite of this occurred. From an examination of all the causes of the epidemic, M. Boudet assigns the first place to the exanthematous fevers, while the unfavorable hygienic conditions of children in the hospital probably increased their liability to the disease. The influence of atmospheric changes he regards as very doubtful, and the influence of contagion as still more problematical, except in 1841, when angina became very frequent, and was readily communicated from one patient to another.

In ten cases tracheotomy was performed, but life was not preserved in a single instance. The conclusions to which M. Boudet has arrived with reference to the operation will be best given in his own words.

"In conclusion," says he, "seeing that no advantage resulted from tracheotomy when false membranes existed in the bronchi, and that it appears to have given rise to ulcerations in one case, and to chronic inflammation of the trachea in another, seeing too that in every instance without exception in which it was performed, double pneumonia was found on examining the body after death, while in some cases of very severe croup in which the patients died after the disease had existed for some time, but in which tracheotomy was not performed, no inflammation of the lungs was discovered on a post-mortem examination, while on the other hand, in some instances where the disease was neither very severe nor very far advanced, life seems to have been prolonged, it may be fairly concluded that the advantage of tracheotomy were very small; that it apparently contributed to the production of pneumonia, and of ulceration or thickening of the trachea, and that when the bronchi contained false membranes, it was of no use whatever."

<div align="right">Archives Générales de Médecine. Fevrier et Avril, 1842.</div>

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

On the Recent Discoveries Relative to the Chemical Processes for detecting Arsenic.
By A. DEVERGIE.

AMONG the numerous processes lately examined by the committee of the Academy of Sciences, appointed to investigate the subject of arsenical poisoning, one suggested by M. Devergie in 1840, in his treatise on Legal Medicine, was omitted. As the committee reported their approval of one process in which a large quantity of sulphuric acid is necessarily employed, it is right (observes M. Devergie,) to place before them an account of those researches made by me, to show that the use of this acid is decidedly objectionable in all such cases. In examining the viscera of Nicholas Mercier in 1839, arsenic was discovered both by the use of nitrate of potash and sulphuric acid. The nitrate of potash was then tried with sulphuric acid alone, and still deposits of arsenic were procured. This was also the case when the purest nitrate of potash which had been expressly prepared by acting on pure potash, with pure nitric acid was used. This led to the suspicion that the source of error was in the sulphuric acid, and that the arsenic was introduced into it in the course of manufacture.

The following is an outline of the process which I have proposed.

1. The animal matter is slowly dried and weighed.

2. It is then to be dissolved by the aid of heat in a solution of pure potash. The arsenious acid, contained in the animal matter, is thereby transformed into fixed arsenite of potash.

3. Nitrate of lime is now to be added to the liquid mass, in the proportion of about two thirds of the weight of the dried animal matter; from this, arsenite of lime, hydrate of lime, and nitrate of potash result.

4, The mixture is evaporated to dryness, and then strongly heated in one or two points ; combustion ensues and slowly spreads throughout the mass.   On cooling, the dry residue is treated with muriatic acid until all effervescence has ceased ; water is added, and the solution filtered.

In a well-conducted operation, a colourless liquid easily admitting of filtration is thereby procured.   This liquid is introduced into Marsh's apparatus, and should there not be a sufficient evolution of hydrogen, more muriatic acid is added.   The first portions of gas will be found to contain hydrogen.

Such is an outline of the process which it was my intention to propose to the Academy of Sciences.   *Annales de Hygiène. Jan.* 1842.

[REMARKS. The remainder of this paper is purely controversial, and presents no point of interest to the medico-legal student.   It is much to be regretted that MM. Orfila and Devergie cannot come to an amicable understanding on the relative merits of their processes for detecting arsenic, more especially since there are strong objections in our views to the methods adopted by both.   We have extracted this account of M. Devergie's process, in order to complete the history of the subject, and in justice to that gentleman, to let him speak for himself.   In our opinion, the process is too complex to render its adoption advisable in most cases of arsenical poisoning ; and it has the disadvantage of introducing too many foreign substances into the mixture requiring analysis.   We do not see that any particular benefit is derived from transforming arsenious acid into arsenite of lime ; or in what respect, this is superior to the original process of Rapp, since practised by Orfila, of deflagrating the dried animal substance with nitrate of potash.   In short those who have tried the deflagrating method must have found that a very large quantity of saline matter results, from which it is difficult to free the liquid, without losing arsenic.   If the arsenic be in moderately large quantity, and the arsenical matter not very abundant, there is no necessity for a medical jurist to adopt any of these delicate processes for the detection and insulation of the poison ; but where the conditions are reversed, the arsenic being in small, and the animal matter in large proportion ; then although this is the only case in which they would be employed, they are liable to defeat the object of the analyst by overloading the solution with saline matter.   For this reason, we object to the plan of M. Devergie, as much as to that proposed by Orfila, and consider that better results may be obtained by resorting to the carbonising process of MM. Dauger and Flaudin.   This has already been fully described in a former number of the Review.

Cases of Asphyxia from Coal Gas.
By G. TOURDES, Prof. of Legal Medicine at Strasburg.

[THERE are but very few accurate reports of cases of suffocation from coal gas :—the following will therefore be found interesting to the medical jurist.]

In January, 1841, a whole family, residing at Strasburg, were subjected for forty successive hours to the deleterious action of coal-gas.   Five persons, the father, three children, and a servant of the family, died.   The mother alone recovered, after a long and severe illness.   On closely examining the premises, it was found that the gas had escaped from a pipe which passed near a cellar, immediately below the lodging, in which these people lived.   On the discovery of the accident three of the persons appeared to have been dead for some hours, namely, two of the children and a servant.   The body of the fourth, a little girl, about five years of age, presented still some traces of warmth.   The two others, the father and mother, still breathed; but the father died in twenty-four hours, notwithstanding the most energetic treatment; the mother slowly recovered.

A post-mortem examination of the bodies was made, and there was not much difference in the appearances in the five subjects.   The brain and its membranes were congested.   The vessels of the pia mater were especially gorged with blood,

and the surface of the whole brain was intensely red. The veins of the spinal canal were also congested. In three of the cases, there was considerable effusion of coagulated blood, between the dura mater and the bony canal. The medulla spinalis presented no particular appearance.

The air-passages were strongly injected from the base of the tongue downwards, to the extreme bronchial ramifications. The velum palati and epiglottis were likewise much injected. A thick viscid froth with streaks of blood was found diffused over these parts, except in the case of the father, who had survived twenty-four hours, and had been bled several times. There was one peculiar appearance met with in the whole of these cases. The parenchyma of the lungs was throughout its whole extent of a bright red colour, contrasting strongly with the dark colour of the surface of the organs. The blood was found coagulated in the heart and large vessels, especially in the right auricle. The liver was gorged with blood, and of a deep red colour; in the case of the father, it was pale and of a gray yellow colour. In four of the subjects, the bladder was distended with an enormous quantity of limpid urine. There was nothing remarkable to be seen in the intestinal canal.

Thus then, it will be observed the appearances common to these cases were, coagulation of the blood,—its deep colour,—the bright red colour of the substance of the lungs,—coagulation of the vessels of the brain and of the vertebral sinuses,—a redness of the base of the tongue and fauces, with an abundant frothy mucus streaked with blood in the aerial passages.

As a summary of the effects of coal-gas on the human subject, derived from these and other observations, the following points may be enumerated : vertigo, cephalalgia, nausea with vomiting, disturbed intellectual faculties with loss of consciousness, general weakness and depression, partial paralysis, convulsions and the usual phenomena of asphyxia slowly appearing but becoming confirmed as life approaches to its termination.

The following is the composition of the Strasburg coal-gas, which led to these fatal accidents :

Hydrogen	31
Proto-carburetted hydrogen	22·5
Carbonic oxide	21·9
Nitrogen	14·
Bicarb. hydrogen and pyrelain	6·
Carbonic acid	4·6
	100·

The preparations of these bodies, although not always the same, do not vary much from the above ; for any great variation would materially affect the illuminating power of the gas.

Coal-gas owes its peculiar odour to the pyrogenous carburets of hydrogen, which it contains. It was found by experiment that this odour was well marked, when the proportion of the gas in air amounted only to 1·150th, that it was very perceptible even up to 1·700th, and when the gas formed only 1·1000th part of the mixture by volume, there was a decided impression on the sense of smelling, although this was of a doubtful character.

It might at first view be supposed, that the explosibility of the gas would rather interfere with its asphyxiating properties ; but on the occasion of this accident, it was proved that in the apartment in which the individuals were, a stove had been for a long time in active combustion, and a candle had been completely burnt out without producing an explosion in an atmosphere of the gas thus shown to be capable of causing death. Indeed, experiment has established that explosion is liable to take place, only when the gas forms about an eleventh part of the atmosphere.

Experiments were then made on animals to determine the relatively poisonous effects of this gas. In a pure state, coal-gas was found to destroy life imme-

diately, in a proportion of one eighth, it killed a rabbit in five minutes, and a dog in twelve. In a dose of one fifteenth, (a non-explosive proportion,) it killed rabbits in nine, twelve, and fourteen minutes ; and pigeons in five minutes. In a proportion of one thirtieth, its action was very evident; but it destroyed life slowly. At one fiftieth, its power was much diminished ; and at one seventy-fifth it but slightly affected rabbits ; in this last proportion, it was not found to destroy life ; and if the experiment be prolonged, we have merely the effects of a vitiated or unrenewed atmosphere.

The chief symptoms in animals, were convulsions, followed by collapse, difficult respiration and drowsiness. On examining the bodies, the lungs, liver, brain, and other organs presented nothing remarkable; but firm coagula of blood, were commonly found in the heart.

An attempt was then made to determine to which of the components of coal-gas, its fatal action on the economy was due. After many experiments, M. Tourdes inferred that the deleterious agent was the carbonic oxide.

There can be no doubt, that coal-gas has a directly poisonous action, and that it is not a mere asphyxiating agent, like hydrogen or nitrogen. Thus it begins to affect the system, even when present in very small proportion ; and the experiments already related, certainly show that it could not be substituted for nitrogen in air, without destroying life very speedily ; therefore the irresistible inference is, that it is a *direct* poison. The experiments performed on animals as well as the chemical analysis appear to prove, that the carbonic oxide is the principal cause of the energetic action of coal gas. This is the agent which affects the system most powerfully and rapidly. The pyrelains may contribute to its operation, but not to any well-marked degree ; the bicarburetted hydrogen has but little influence, the proto-carburetted hydrogen still less, while the hydrogen and nitrogen are inert, and simply act by excluding the air necessary to the continuance of respiration.

It is difficult to state what proportion of this gas, in a given atmosphere, is required to prove fatal to man ; all that we know is that it may destroy life, when in a smaller proportion than one eleventh part. In the accident here reported, ignited bodies continued to burn without leading to explosion ; the same has been observed in certain cases which occurred in Paris. Compared with other gases, coal-gas is more powerful in its effects than nitrogen, hydrogen, carbonic acid or carburetted hydrogen ; but it is less powerful than carbonic oxide and sulphuretted hydrogen. The post-mortem appearances show that the action of this gas is chiefly confined to the nervous system ; the respiratory organs are likewise affected, but more slowly. A peculiar coagulated state of the blood is also met with. This may influence the nature of the symptoms, although it is difficult to say in what way. Can the coagulation be caused by the carbonic oxide or the oily principles ? Or may it not be a purely chemical change, produced after death, by the action of these agents ? A current of coal-gas was passed through liquid ox-blood without coagulating it. The blood was almost always found coagulated in animals which had been killed by coal-gas, whether with or without its odoriferous principles, and the same appearance was met with in animals killed by carbonic oxide, or carburetted hydrogen. Whatever opinion we may form, it is sufficient to have established, that this compound has a specific influence on the nervous and sanguineous system.

Annales de Hygiène. Jan. 1842.

[REMARKS. This is a very important contribution to the toxicological history of the gases ; and we must compliment M. Tourdes on the careful manner in which the case was investigated. M. Tourdes's experience led him to know the exact points which required to be examined ; while it is a very common circumstance that when reports of this kind are drawn up, all kinds of matters are accumulated without reference to what the case is really capable of proving, or in what way it may be made to add to our experience. It is this want of system in drawing up reports, that renders most of those published perfectly useless

to the medical jurist; and the profession is therefore the more indebted to the author of the present paper for the care bestowed upon it. There are some points, however, which require a few remarks. It is stated that a mixture of coal-gas with air in a non-explosive proportion (1-15th) will rapidly cause death, and it is inferred that the mixture breathed in these cases could not have been explosive, because there were lighted bodies present. It is also inferred that a mixture in explosive proportions (1-11th of coal-gas) would be irrespirable, and soon destroy life. This inference is scarcely reconcileable with the well-known fact that those employed in coal-mines can work for a length of time by means of a safety-lamp, in spots where a lighted candle would immediately cause an explosion. The gaseous mixture in coal-mines is certainly different in composition from that described by M. Tourdes; but still we do not see that we can fairly connect the explosive properties with the irrespirability of such mixtures. We quite agree with the reporter, that the respiration of mixtures of this kind must be in the end hurtful, even where the gas is considerably diluted; and the cases which he describes probably resulted from the slow action of a very diluted mixture.

The author considers that carbonic oxide is the principal deleterious agent in coal-gas, and perhaps in these cases it was so; but it is necessary to remark, that the Strasburg gas, according to the analysis, contains an unusually large proportion of that compound. It is evident from this analysis, that the gas examined must have been distilled at a very high temperature; and its chemical constitution, therefore changed; for more than one half of it is formed of hydrogen and carbonic oxide. In ordinary gas, the proportion of carbonic oxide fluctuates from 3 to 11 per cent.; and is seldom greater than this, but the gas examined by M. Tourdes, contained nearly double that quantity. Hence these were rather cases of poisoning by carbonic oxide, than by coal-gas; and it is clear, if M. Tourdes's theory were true, we should have to invent some other explanation to account for death, where the coal-gas contains little or no carbonic oxide: for there is no sort of doubt, that in this state, it will prove fatal to life. We look upon coal-gas as a directly poisonous mixture, in which the active agent is liable to vary.

Among the post-mortem appearances, the author of the report alludes to a particular coagulated state of the blood in the heart and great vessels. He found this also in nearly all the animals killed by the gas. We must, however, remark that this is a sign, upon which no reliance can be placed as evidence of poisoning by coal-gas. In two interesting cases of poisoning by this gas, communicated by Mr. Key to the Guy's Hospital Reports, (No. viii, p. 107, April, 1839,) there was *extreme fluidity* of the blood, so much so that *this* was set down as one of the most striking appearances. These two cases occurred under circumstances very similar to those described by M. Tourdes; but the only resemblance in the post-mortem appearances, was great injection of the mucous membrane of the air-passages. These conflicting observations show us, that we have yet much to learn on the subject of poisoning by coal-gas, and that it would be advisable at present to collect facts, without attempting to generalize from them. In relation to medical police, this subject is one of considerable importance: for gas is now introduced into many dwelling-houses, and it is a question which has not yet been sufficiently attended to, namely how far the long-continued respiration of an atmosphere containing but a small proportion of coal-gas, may affect health and life. The evil effects are not immediate; and therefore the respiration of such contaminated air is not considered dangerous or hurtful, but there is no doubt that the health of a person may under these circumstances become insidiously undermined.]

ORIGINAL PAPERS IN THE BRITISH MEDICAL JOURNALS,

For the Quarter ending 20th Dec. 1842.

ANATOMY, PHYSIOLOGY, AND MORBID ANATOMY.

Dr. LAYCOCK—On a general Law of vital Periodicity	*Lancet,* Oct. 22.
On Periodicity	*Ibid.* Dec. 17.
Dr. COLLIER—On Intra-combustion	*Ibid.* Oct. 22.
Dr. BARRY—On the Production of Muscle	*Ibid.* Oct. 29.
Mr. ANCELL—On the Doctrines of Liebig	*Ibid.* Nov. 12.
Dr. WATTS—On Coagulation of the Blood	*Ibid.* Nov. 12.
Mr. SHAW—On the Circulation of the Liver	*Med. Gaz.* Sept. 30.
Mr. HERON—Absorption of the Stomach of a Gull	*Dub. Press,* Oct. 12.
Mr. ADAMS—Case of Somnambulism and Clairvoyance	*Med. Times,* Oct. 15.
Mr. PRANKERD—A Man with three Testicles	*Prov. Times,* Nov. 19.
Dr. MACARTNEY—On the Brain of the Chimpanzee	*Dublin Press,* Nov. 16.
Dr. ANDERSON—Anatomy of Cauliflower Excrescence	*Edin. Med. Journ.* Oct.
Mr. ADAMS—Case of Clairvoyance	*Med. Times,* Oct. 15.
Mr. KESTEVEN—Influence of Mothers' Imagination	*Med. Times,* Nov. 19.
Mr. DAY—Tumour of the Dura Mater	*Prov. Journ.* Dec. 3.
Dr. HOCKEN—On the Action of the Muscles of the Eye	*Edin. Journ.* Oct. 1.
Mr. SPENCE—Anatomy of the Par Vagum	*Ibid.* Oct. 1.
Mr. EWART—On the Skin and Mucous Membrane	*Ibid.* Oct. 1.

PATHOLOGY, PRACTICAL MEDICINE, AND THERAPEUTICS.

Mr. ORWIN—On Epilepsy from protracted Lactation	*Prov. Jour.* Oct. 15.
Mr. WEST—On the Diagnosis of Cholera	*Ibid.* Oct. 15.
Dr. BEVERLY—Case of Hemiplegia	*Ibid.* Oct. 22.
Dr. KNIGHT—Effects of disorder of Colon	*Ibid.* Oct. 22.
Dr. HASTINGS—On the Cold Water Cure	*Ibid.* Oct. 22.
Mr. BARRETT—On the Diagnosis of Cholera	*Ibid.* Oct. 29.
Mr. SADLER—On the Diagnosis of Cholera	*Ibid.* Nov. 5.
M. COMBETTE—Diabetes cured by Iodide of Iron	*Ibid.* Nov. 5.
Mr. EDWARDS—Case of Spasmodic Cholera	*Ibid.* Nov. 12.
Mr. WEST—On the Diagnosis of Cholera	*Ibid.* Nov. 12.
Dr. KANE—Medical Cases	*Dublin Press,* Sept. 28.
Mr. CATTY—On the waters of Ems	*Ibid.* Oct. 12.
Mr. DONOVAN—On the Effects of a New Remedy	*Dublin Journal,* Nov, 1.
Dr. HASTINGS—Illustrations of the Water Cure	*Prov. Jour.* Nov. 19.
Mr. MACINTIRE—Case of Hydrophobia	*Dublin Press,* Nov. 16.
Dr. JOHNSON—On Epidemie Erysipelas	*Medical Times,* Oct. 29.
Dr. CLAY—On Secale Cornutum	*Ibid.* Oct. 29.
Mr. GORE—On the Secale Cornutum	*Ibid.* Nov. 5.
Mr. JOHNSON—Case of Tetanus treated by Opium	*Ibid.* Nov. 5.
Mr. GREETWOOD—On Secale Cornutum	*Ibid.* Nov. 12.
Mr. LEWIS—On the Treatment of Apoplexy	*Medical Gazette,* Nov. 25.
Mr. ALLISON—On the Diagnosis of Cholera	*Prov. Jour.* Nov. 26.
Mr. TOOGOOD—Brain Affection after Scarlatina	*Ibid.* Nov. 26.
Mr. CHEYNE—Cure of Hay Fever	*Medical Gazette,* Dec. 2.
Mr. ROBERTS—On the Health of Soldiers at Sea	*Ibid.* Dec. 2.
Dr. KINNIS—On Tubercular Leprosy	*Edin. Jour.* Oct. 1.
Mr. PRIOR—On Indian Dysentery	*Ibid.* Oct. 1.
Dr. BENNETT—On Inflammation of the Nervous Centres	*Ibid.* Oct. 1.
Dr. STRONG—On Sulphate of Zinc in Bowel Complaints	*Ibid.* Oct. 1.
Mr. WORTHINGTON—Case of Cerebral Affection	*Prov. Jour.* Dec. 10.
Mr. JAMESON—On Swelled Leg after Fever	*Ibid.* Dec. 10.
Dr. FIFE—On the Diagnosis of Cholera	*Ibid.* Dec. 10.
Mr. PERRY—Case of Puerperal Mania	*Lancet,* Dec. 10.
Mr. HITCHMAN—On the Effect of mental Impressions	*Med. Gaz.* Dec. 10.

SURGERY, INCLUDING DISEASES OF THE EYE AND EAR.

MIDWIFERY, AND DISEASES OF WOMEN AND CHILDREN.

MATERIA MEDICA, PHARMACY, AND CHEMISTRY.

N.B. The selections from the British and Foreign Journals will be found less numerous than usual. It is intended hereafter to replace these partial extracts by a digested Report of the progress of each department of medical science during the preceding twelve months. The first of these Reports will appear in the October Number.

PART FOURTH.

Medical Intelligence.

Part II.—*On the Origin and Functions of Cells.*

By William B. Carpenter, m.d.,
Lecturer on Physiology in the Bristol Medical School.

general functions of cells in vegetables.

1. From the time when the study of vegetable anatomy was sufficiently advanced to permit the classification of the few and easily-recognized forms of tissue which exist in plants, and the knowledge of their physiology became sufficiently extensive and precise to permit their various functional operations to be referred to distinct organs, it has been evident that all those changes in which the organic life essentially consists are performed through the medium of *cells* alone, in the highest and most complex structure, as in the meanest and simplest. The functions of absorption, assimilation, fixation of carbon from the atmosphere, respiration, exhalation, secretion, and reproduction, are all effected by the one single cell, of which each individual among the humblest aerial flags, or the mucedinous fungi, consists. Even in the larger and apparently more complex structures of the sea-weeds, there is but little more separation of these functions; for in these also the whole fabric consists of cells, of which every one lives almost entirely for itself alone, and is but little dependent upon its fellows. In the highest plants, on the other hand, we find a variety of organs adapted to perform the different functions; and we also find a greater variety of elementary structure. But the parts of these organs essentially concerned in the respective functions of each are still *cells;* and the new or superadded tissues are only for the purpose of establishing that communication between organs now separated from each other, which is necessary for the continuance of their actions, and for the requisite mechanical support to the soft parts. Thus the apparatus of ducts which conveys to the leaves the sap absorbed by the roots, and the network of capillary tubes which the elaborated sap traverses in its way from the leaves to the tissues it has to nourish, cannot be regarded as themselves actively participating in the vital actions of the plant; since they are mere passive canals, which would not be needed if the leaves were less distant from the parts with which they are functionally connected. In like manner, the spiral vessels, which convey air through the interior of the plant, are mere conduits, serving to bring it into contact with tissues, which, owing to their distance from the surface, would be otherwise excluded from atmospheric influence. Lastly, the woody fibres, of which so large a proportion of the fabric of the massive trunk is composed, serve no other purpose in the vital functions than that of assisting to convey fluid along the stem and branches, (or rather, permitting its transit,) and that of affording mechanical support and protection to the softer tissues.

2. All the operations concerned in the preparation of that formative fluid, at whose expense the increase of the woody structure takes place, and from which are afterwards separated those products that give it density and durability, are performed by *cells* alone. Thus, when we analyse the structure of any organ concerned in the nutritive operations of a plant, we shall commonly find it to consist of three parts: a framework of woody tissue, for the purpose of affording mechanical support, and of assisting in the conveyance of fluid; a vascular apparatus for the conveyance of air and watery fluids to or from the organ; and a tissue composed of cells, by which alone the functions peculiar to the organ are performed. Thus it is well known that the chief agent in the absorption of the fluid in contact with the roots, is neither the woody fibre which constitutes the largest portion of

the fabric, nor the vessels they contain, but the succulent cellular tissue at the growing extremities of their ultimate ramifications. In like manner, the fixation of carbon from the atmosphere, and the exhalation of superfluous fluid, which are the special functions of the leaves, are performed, not by their framework of woody fibre and vessels, but by their cellular parenchyma. The same may be said of the tissue concerned in secretion; which consists of cells that have the property of separating certain ingredients of the sap elaborated by the leaves; these they either store up in their own cavities, or set free again, probably by the rupture of the secreting cell.

3. Thus all the organic functions of the highest vegetable are really performed by cells alone. It is by those constituting the green parenchyma of the leaves, that the most important of these functions are effected; for in them the crude watery sap which ascends from the roots, parts with a large quantity of its fluid, and receives an additional amount of carbon, detached by some very powerful agency that is at present quite incomprehensible, from the oxygen with which it is united by the most powerful chemical affinity in the carbonic acid of the atmosphere. From these elements are produced all the varieties of organic compounds, so numerous and diversified in the vegetable kingdom, and so important as furnishing the materials for animal as well as vegetable organization. The descending or elaborated sap is a formative fluid, ready to be converted into solid tissue. Though chiefly composed of a mucilaginous saccharine substance, yet it is evidently very far from being a mere solution of gum and sugar; since it is already prepared to exhibit vital properties altogether unlike those which such a solution would possess. When it is examined with the microscope, it is seen to contain multitudes of minute granules; and these, aggregating together, become the nuclei from which cells are formed. The contact of a living tissue appears to be the only condition requisite for the formation of such cells, and for their admittance into the general structure by forming communications with the parts already existing. The process may be well observed in the ovule, when being prepared for fecundation; for its cavity is filled with newly-forming cells, developed in the midst of the starchy albumen. In general, the duration of life in these cells is very brief; for in those species in which the mature seed has no separate albumen, they dissolve away in proportion as the embryo absorbs the starchy matter in the midst of which they are developed; and in those in which this absorption does not take place until the period of germination, several generations of cells are produced and disappear, previously to the formation of those which constitute the tissue of the albumen.

4. The conversion of the formative fluid into organized tissue, by the development of cells from the granular nuclei it contains, may also be observed in the cambium or glutinous sap intervening between the bark and wood,—the place in which the new layers of bark and wood are to be produced. Of the mode in which the first cells are produced in the formative fluid, according to the observations of Schleiden, an account has been given in a former volume (vol. IX. p. 499); and little need be here added to it, except a doubt whether the formation of a distinct nucleus or cytoblast is in all instances necessary, or whether a cell may not be formed by the simple coalescence of granules. That the function of the cytoblast is not restricted (as supposed by Schleiden) to the production of the first or primordial cell, will appear from observations to be presently adduced (§ 12.); when these are taken in connexion with the fact, observed by myself, as well as by several other microscopists, that the nucleus of vegetable cells is *not* absorbed in a great number of the cases in which it seems to be so, but either remains adherent to the wall of the cell (though not easily seen on account of its transparency), or separates into its component granules which become the germs of new cells, or contributes to the formation of the spinal fibrillæ, and other secondary products which appear at a subsequent time within the parent-cell.

5. Not only are the proper organic functions of plants thus dependent upon the agency of cells; but their reproduction is likewise. The author has elsewhere*

* Principles of General and Comparative Physiology, 2d edition, §§ 592-601.

explained in full his conclusions respecting the essential nature of this process, de-
rived from an analysis of the operations concerned in it, in all classes of vegetables;
and a very brief account of it will therefore here suffice.   In all plants there exist
certain cells, which contain granules that have the power of developing themselves
into new cells, when altogether separated from the parent structure.   In the higher
tribes, these reproductive cells are very distinct from the rest, and are known as
pollen-grains among the Phanerogamia, and as spores in the Cryptogamia.   In
the lowest tribes of the latter, where each individual consists but of a single cell,
or of an aggregation of a few having similar properties, that cell has the same
power of reproduction.   Here, therefore, we meet with the simplest phase of the
process.   The parent-cell, arrived at maturity by the exercise of its organic func-
tions, bursts, and liberates its contained granules.   These, at once thrown upon
their own resources, and entirely dependent for their nutrition on the surrounding
elements, develope themselves into new cells, which repeat the life of their original.
Such is the whole history of the reproduction in the inferior Cryptogamia.   In the
higher tribes of that division, the reproductive cell or spore does not burst; but
the first cells of the new structure are developed within it; and these gradually
extend, by a similar process of multiplication, into that primary leaf-like expansion,
which is the first-formed structure in all plants.   Here, it may be surmised, the
continued vital operation of the parent-cell aids its contained germs in their early
development, elaborating their food from the surrounding elements, until they are
able to obtain it for themselves.

6. But in the Phanerogamia a more complex apparatus is superadded for this
purpose; the ovule being adapted for the reception of the germs prepared by the
pollen-grain, and conveyed into it by an extension of the pollen-tube; and being
obviously intended to supply these with nourishment of a highly-elaborated kind,
up to a comparatively late period of their development,—that at which the true leaves
are unfolded, and the permanent roots embedded in the soil.   During the whole
of the early life of the embryo of the highest plant, its tissue consists of cells alone.
The structure first formed is a leaf-like expansion (the single or double cotyledon)
closely resembling that which constitutes the permanent frond of the inferior cryp-
togamia: this absorbs the nutriment prepared by the parent, and brought in con-
tact with its surface; and its cells effect a still further change in it, by which it is
made ready for the nutrition of the embryo that is to be developed from its centre.

7. It is interesting to observe that in this, the earliest phase of the embryonic
life of the plant, there is a manifestation of that arrangement of the absorbent ap-
paratus, which is characteristic of the vegetable kingdom in general, that, namely,
which is adapted for absorption by the *external* surface.   The cells of the cotyledon
which is being developed in the seed of the flowering-plant, are spread forth in
contact with the starchy fluid which they are destined to absorb; just as are those
of the frond of the sea-weed in contact with the water it inhabits.   It is only when
the advancing development of the embryo requires a provision for the conveyance
to it of the nourishment thus obtained, that we find vessels developed in its tissue;
and it is only when its increasing size renders necessary some provision for addi-
tional strength, that woody fibre is generated.

GENERAL FUNCTIONS OF CELLS IN ANIMALS.

8. Until a comparatively recent period, nothing has been known of the pheno-
mena of *cell-life* in animals.   Although many isolated facts had been ascertained
by Purkinje, Valentin, Henle, Müller, Wagner, Turpin, and others, in regard to
the existence of nucleated cells in the solids and fluids of the body, the production
of these cells from pre-existent nuclei, and the development of new cells within
those of a preceding generation, it was Schwann who first gave expression to the
important generalization, that nucleated cells are the basis of *all* animal as well
as vegetable structures; a doctrine more fruitful, perhaps, in novel results and
widely-extended applications, than any other in modern physiology.   For whilst
some of the followers of Schwann, in the same line of inquiry, have shown that

certain limitations are necessary, a few of the tissues being produced more directly, by the simple consolidation of the fluid plasma into fibrillæ and membranous lamellæ, and some (as would appear from Henle's observations) being formed by the coalescence of the elements of cells, whose development into cells has been arrested; other observers have given an extension to Schwann's doctrines that he could not have himself anticipated. For not only does it now appear that nearly all the animal tissues, however great the alterations they may have undergone in structure and properties, have their immediate origin in cells; but that *in animals as in plants, all the changes in which organic life essentially consists are performed by cells, scarcely distinguishable from each other by any well-marked characters.*

9: The author is not aware that this proposition has been yet stated in so general a form. In fact, many of the data upon which it is founded are but of very recent discovery: and it is the object of the present report to bring them systematically together, and to show their bearing on each other. It may be necessary to explain briefly the meaning and application of this statement before proceeding to the demonstration of it. The purely *animal* functions, those of the nervous and muscular systems, are not included in it; nor are those of a merely physical character, such as the movement of fluids through canals, or the resistance and support afforded by the solid and elastic tissues. These last, as in vegetables, may be regarded as *addenda* for the purpose of supplying the conditions necessary for those really vital operations in which organic life essentially consists. We know of no animal so simple as the lowest cryptogamic plant; but there is reason to believe that there are many in which no vessels exist, their tissue being everywhere in near contact with the nutrient fluid, and absorbing directly from it; and it is certain that there are many in which a few scattered muscular fibres and nervous filaments constitute the only departure from the general type of *cellular**   tissue. Here, then, there is no difficulty in understanding that all the functions of organic life, absorption, assimilation, nutrition, respiration, secretion, and reproduction, must be performed by cells. Again, in the early condition of the embryo, which is at first nothing more than a mass of cells, precisely the same holds good. For some time, its life is entirely vegetative; it absorbs its nutriment by cells spread over the yelk; and this nutriment is at first applied solely to the development of new cells, some of which gradually undergo metamorphosis into other tissues. But the same will be found true of this function in the adult state of the highest animal; for nutritive absorption is in it also performed by cells, which appear destined to this function alone. In like manner it will appear that another set of cells have for their office the assimilation of the nutriment, that is, the preparation of it for entering into the composition of the living organized body. Further, it seems certain that the first development of nearly all the tissues takes place from cells, which are produced at the expense of this assimilated nutriment. Again, the separation from the circulating fluid of these products which are to be cast off from it, is also accomplished by cells. (With regard to the simple exhalation of fluid, it may be remarked that this, like imbibition, is a physical function, dependent upon the permeability of membrane; and that the vital action of cells is therefore not necessary for it. The same may perhaps be said of respiration; but we shall find that in this the action of cells is concerned. § 38.) Lastly in regard to reproduction, it appears that the essential part of this process consists, among animals as among plants, of the multiplication of cells under peculiar conditions. These various processes will now be severally considered in detail. It will be desirable, however, to examine in the first instance into the history of the development of cells in the animal; a subject which is so closely connected with the function of reproduction, that the latter may be considered most conveniently at the same time.

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* Here and elsewhere in this Report, the term *cellular* tissue will be applied to the structure properly deserving that name, from its being composed of distinct cells or vesicles, like the parenchyma of plants. That which has been ordinarily termed cellular tissue in animals is much better named fibro-cellular tissue.

ORIGIN AND DEVELOPMENT OF CELLS IN ANIMALS.

10. The original statements of Schwann upon this subject (see vol. IX., pp.505-26), based as they were upon those of Schleiden as to the history of the development of cells in plants, have been found to require certain modifications, to render them conformable to the results obtained by the researches of their numerous followers. The most important of these modifications relates to the development of cells *within* others previously existing, a mode of production which, though very frequent if not universal in vegetables, was considered by Schwann to be of comparatively rare occurrence in animals. The usual place of their formation, according to him, is the exterior of the old ones, and the space intervening between them (loc. cit. p. 522). The doctrine of the development of cells within cells involves also a new view of the constitution and functions of the nucleus. This was considered by Schwann and Schleiden to have performed its office, when the development of the cell originating from it is completed. By Schleiden, the nucleus of vegetable cells was stated to be usually reabsorbed, especially when the cell is destined to undergo still further development; though in some particular tribes of plants it is persistent during the whole life of the cell. (p. 500.) In the tissues of animals, on the other hand, the persistence of the nucleus was generally remarked by Schwann; but he scarcely records any facts which indicate that he regards its function as prolonged beyond the completion of the primordial cell. It is to Dr. Barry that we are indebted for the correction of this important error, for such I believe it is now generally admitted to be; by showing that the function of the nucleus has reference at least as much to the secondary cells, or other new structures, which are to be developed within the parent-cell, as to the first production of the latter. This was one of the novel results of Dr. Barry's embryological researches, the third series of which is devoted to an elucidation of the earliest changes that occur in the mammiferous ovum, previously and subsequently to fecundation; and as these observations not only afford the best illustration of Dr. Barry's views on the development of cells in general, but present one of the most interesting examples of that *cellular life* which it is the object of the present report to bring into notice, we shall give them our first consideration.

11. DR. BARRY'S EMBRYOLOGICAL RESEARCHES. (Third Series, Philosophical Transactions, 1840.) That our readers may understand the nature and importance of Dr. Barry's later contributions to embryological science, we would refer them to an article at the commencement of our Ninth volume, which contains an account of his first memoir, and of the general state of knowledge on the subject, up to the year 1840. We need only now allude, therefore, to the discovery of the *germinal vesicle* by Purkinje, originally in the bird's egg; the universality of the existence of which, in the ova of all animals, has now been satisfactorily demonstrated by the combined labours of Baer, Coste, Valentin, Wagner, and Wharton Jones: as also to that of the *germinal spot*, which was discovered contemporaneously by Wagner and Wharton Jones in the germinal vesicle of the mammiferous ovum, but in addition traced by the former throughout the whole series of animals. By Schwann it was maintained that the germinal vesicle, being the part of the ovum first formed, was to be considered as its nucleus; and that the germinal spot is to be regarded as the *nucleolus*. In regard to the destination of the germinal vesicle, no more definite statement had been given, than that it burst or dissolved away; and that the *cicatricula* occupied its place, as if this originated in its *debris*. Nothing certain or tangible was known as to the nature of this change; still less was it imagined that the cicatricula is a mass of cells, developed from the germinal spot, within the germinal vesicle, by a process which is probably to be regarded as a type of the most essential phenomena of nutrition.

12. *Preliminary changes in the Germinal Vesicle.* Dr. Barry commences by stating that the germinal vesicle does not burst, dissolve away, or become flattened, on or before the fecundation of the ovum, as previously supposed; but that it ceases to be pellucid, in consequence of the development of new cells within it; which new cells become filled with the foundations of other cells, so that the whole is ren-

dered nearly opaque. These new cells originate, when the ovulum is being pre-
pared for fecundation, in the margin of the germinal spot; the granules of which
enlarge, so as at first to exhibit something of a warty appearance, and afterwards
to form a complete annulus of small cells. A dark central point had been pre-
viously noticed by Wagner and others, as occasionally existing in the germinal
spot; and Dr. Barry states that this point always makes its appearance at a certain
period, that in enlarging it resembles a dark globule or ring, and that it is caused
by the existence of a space filled with fluid, which is exceedingly pellucid. The
formation of new cells within the germinal vesicle makes it evident that this is
itself a cell and not a nucleus; the whole structure of the germinal spot is confor-
mable to that of the nucleus or cytoblast of other cells; and it is equally obvious
that the dark central point is identical with that which has been described by
Schleiden and Schwann as the nucleolus. So far, however, from regarding this
nucleolus as the point around which the nucleus is at first formed, Dr. Barry ap-
pears to have satisfactorily proved that it is a transitory appearance in the centre
of the nucleus, indicating that this is resolving itself at its margin into new cells.
Whilst the margin of the germinal spot, now converted into a ring, is thus be-
coming developed into new cells, a finely granular appearance is seen in the part
nearer the centre, and immediately surrounding the central pellucid space; these
granules undergo a gradual enlargement, and are converted into a second annulus
of cells, pushing out (as it were) that previously formed, the cells of which also
are enlarging in the mean time. In the interior of this annulus, another is next
formed by the same process; and in this manner the whole germinal vesicle be-
comes filled with cells, which are arranged in concentric rings, the cells of the outer
ring being the oldest and largest, those of the ring within this being next in size,
and a gradual diminution taking place in each as it is nearer the centre, where we
still see the pellucid space, surrounded by granules. This condition, which indi-
cates that the germinal vesicle is prepared for fecundation, is represented in Fig. 1;
in which the germinal vesicle, marked c, is seen to be full of cells in various stages
of development; and the yelk also is perceived to contain numerous cells, each
having a central nucleus, round which new cells are being formed by a similar
process. As the foundations of new cells successively make their appearance in
the interior of the altered germinal spot, the pellucid central space in the latter
presents changes in its size, and is sometimes scarcely or not at all to be distin-
guished; whence it is concluded by Dr. Barry that the foundations of the new
cells have their origin in the pellucid fluid of that central space. The same remark
applies to nuclei in general; and serves to explain fully the varying appearance
of the nucleoli observed by Schleiden and Schwann. Each of the incipient cells
within the germinal vesicle presents, with more or less distinctness, an interior as-
pect, which indicates the operation there of a process essentially the same as that
which has taken place within the parent cell. This is even more evident in the
cells of the substance surrounding the germinal vesicle at a later period; and the
representation given of these by Dr. Barry may probably be considered as an
equally faithful portrait of what takes place in all cells undergoing the same
change. (Fig. 2.)

13. *Act of Fecundation.* At the period when this preparatory change is taking
place in the germinal vesicle, it is in close contact with the *zona pellucida* (*f*,
fig. 1), the membrane which surrounds the yelk and takes the place of the *mem-
brana vitelli* of oviparous ova. During the development of cells in its interior, it
presents rather a lenticular form; and *that* one of its flattened faces, in which the
spot with its central pellucid space appears, is applied to an attenuated portion of the
zona pellucida, which soon becomes an orifice. This change is of a very re-
markable character; and to Dr. Barry, so far as we are aware, is due the whole
merit of discovering it. We formerly quoted (vol. IX., p. 12,) his account of the
mode in which the ovum, as it becomes mature, is carried against that portion of
the ovisac which is nearest the surface of the ovary; the ovisac itself is forced in
the same direction; all the investments of the ovum are gradually thinned, and at
last give way, so as to allow the access to it of any agent on the exterior of the

ovary, before the ovum is itself extruded.   We now learn that the exterior membrane of the ovum itself undergoes the same change, so as to subject the germinal vesicle to the fecundating influence, whatever may be its nature. (Fig. 3.)   The remarkable coincidence of all these alterations, which seem to have for their object the opening of a direct passage to the pellucid central spot on one side of the germinal vesicle, seems to leave no room for doubt that *this* is the point of fecundation; and further evidence that such is the case is apparent in the subsequent history.   For, soon after the act of fecundation has been accomplished, the germinal vesicle regains its globular form, and returns to the centre of the ovum; the fissure in the zona pellucida at the same time closes up; and there speedily appear, in the pellucid central spot, *two new cells,* "having essentially the same form and general appearance as the cells of other parts of the ovum; but in general attaining a more considerable size, and being objects of much greater importance." (Fig. 4.) These two cells undergo rapid enlargement, and at last nearly fill the germinal vesicle. (Fig. 5.)   Their increase takes place at the expense of the cells which previously occupied its cavity; for these gradually disappear by liquefaction; the outer layers, which were the first produced, being the first to undergo this change. The cells of the yelk undergo liquefaction during the same period, and have completely disappeared by the time that the germinal vesicle is filled by the "twin cells."

14. The only intimation of Dr. Barry's views on the nature of the act of fecundation, is contained in the following statement: "On one occasion, in an ovum of five hours and a quarter, I saw in the orifice of the membrane f (fig. 3), an object very much resembling a spermatozoon which had increased in size.   Its large extremity was directed towards the interior of the ovum."   In a note, Dr. Barry adds—"I am not prepared to say that this was certainly a spermatozoon; but it seems proper to record the observation."   The caution which Dr. Barry here manifests, in regard to an observation of so much interest, speaks much in favour of the validity of his other statements; more especially as the inherent probability of the correctness of his idea was previously so strong.   For in the lower oviparous vertebrata, the spermatic fluid is directly applied to the ova; and spermatozoa had been seen on the surface of the ovarium by Bischoff, as well as by Dr. Barry himself.   It was obvious that some object was to be answered by their contact with the ova; and it seemed a legitimate influence, from the facts already stated, that this purpose is the exertion of some immediate influence on the pellucid spot of the germinal vesicle.   It is highly satisfactory, however, to find Dr. Barry's statements completely confirmed by the observation of Dr. A. Farre; who is understood to have distinctly seen the spermatozoa of the earth-worm inserted into the ova, and to have exhibited them to other physiologists.

15. In order that the nature of the act of fecundation may be rightly understood, it will be desirable to digress a little, to inquire into the real character of the spermatozoa.   For a long period, as is well known, these bodies have enjoyed the reputation of spermatic *animalcules;* and the imagination of some microscopists, filling up the deficiencies of their imperfect instruments, gave origin to descriptions of their various parts—head, eyes, mouth, anus, limbs, &c.—which are now generally acknowledged to have no existence.   Moreover, several instances of active movement present themselves in vegetable as well as in animal structures, from which it would be absurd to infer the existence of an independent animality.   Thus the sporules of many algæ, the ciliated epithelium-scales to be found on some part of the surfaces of almost all animals, and the blood-corpuscles of mammalia under peculiar circumstances (as Dr. Barry has stated,* and shown to the author,) will perform movements as regular, prolonged, and vigorous, as those of the spermatozoa.   Since neither their structure nor their movements, therefore, can be regarded as valid indications of their nature, our chief source of guidance is the history of their development.   By Wagner it has been shown that they are developed within cells; and that they originate in some manner from the granules formed by the dispersion of the nuclei of these cells.   Their development seems, in

* On the Corpuscles of the Blood.   First Series.   Phil. Trans 1840.

fact, conformable to the general history of the production of animal *fibres;* and has no correspondence whatever with the evolution of animalcules. Dr. Barry has been led by his later researches to the belief that the parent cell is in reality a metamorphosed blood-corpuscle; and that the minute discs into which the nucleus resolves itself (in the mode to be hereafter explained) form, by their linear aggregation, the filamentary bodies known as spermatozoa. If this be true, it is easy to understand how the spermatozoa may deposit, in the pellucid space on the side of the germinal vesicle (where there is probably an opening into its cavity) the nuclei which are the foundations of the two new cells that subsequently appear in it; and the act of fecundation seems thus essentially to consist of the implantation (so to speak) of the germs of one or more cells, set free by the male organs, in the nidus prepared by the female, who supplies all the materials for their development into the complete organism. How completely this view harmonises with the phenomena of vegetable reproduction, is apparent from the brief notice of the latter already given in this report. (§§ 4, 5.)

16. The mysterious process of generation has thus been unveiled almost as completely as it is likely to be; for it has been shown to be reducible to the ordinary principles which govern the nutrition of the fabric;—the difference being, that the cell-germs are not developed within the cell that produced them, but are conveyed into others, where nourishment is prepared for them by a different set of organs, which usually belong in animals to a different being.

17. *Development of the Embryo.* We return to the history of the ovum, subsequently to the complete development of the "twin cells," which now fill the entire cavity of the germinal vesicle. The membranous wall of the germinal vesicle, now distended to a large size, soon afterwards disappears by liquefaction. Each of the twin cells gives origin to two others; and each of the four thus produced, to two more; and this mode of augmentation continues, until the germ consists of a mulberry-like object, the cells of which are so numerous as not to admit of being counted. (Fig. 7.) The *mode* of development of each generation of cells is exactly the same as that by which the twin parent-cells originated in the germinal vesicle. Every cell, whatever its minuteness, if its interior can be discerned, is found filled with the foundations of new cells, into which its nucleus has been resolved. These foundations at an early period are arranged in concentric layers around a pellucid point; subsequently they are larger; at a later period, when the outer layer has partially liquefied, the inner cells have increased in size; and at a period still more advanced, each cell contains but *two,* destined to succeed the parent cell, the others having disappeared by liquefaction. (Fig. 6.)

18. The next stage of the process is the formation of a layer of cells around the yelk; this layer is an extension of the peripheral portion of the mulberry mass, which now becomes flattened against one side of the ovum. Thus originates the *germinal membrane;* which, though it does not *form* the embryo (as was once supposed) performs a very important part in its early development. At the same period a large and peculiar cell, previously in the centre of the mass, comes into view; from this cell all the permanent structure of the embryo originates. It possesses a remarkably distinct nucleus, in the form of a flattened disc, which consists (as in other cases) of minute granules, and has in its centre a transparent space filled with pellucid fluid. This embryonic cell soon partakes of the general flattening; and as its own walls and the fluids contained in it are very transparent, it forms a large *pellucid area* around the nucleus, separating it from the other cells of the germinal mass. (Fig. 8.) In the nucleus of this vesicle a distinct separation soon manifests itself between its *central* and *peripheral* portion; the latter is first developed into cells, and forms a hollow membrane, which gradually extends itself through the ovum, until its surface comes in contact with the membranous layer of cells previously formed on its surface, and thus constitutes a second or inner membranous layer. Another is subsequently produced from an inner part of the nucleus of the embryonic cell; and thus are developed the three layers of the germinal membrane, the serous or exterior, the vascular or middle, and the mucous or interior. The permanent structures of the embryo are developed from the central

portion of the nucleus, which then assumes an elongated form; and it is the incipient formation of cells near the central line of this nucleus which gives rise to the appearance known as the *primitive trace.*

19. It is not our present purpose, however, to pursue the history of the evolution of the embryo, and the metamorphosis of its first-formed cells into its various kinds of tissue. Our object is to examine into the mode by which the alimentary materials prepared by the parent become subservient to its nutrition. The germinal membrane, which now completely envelopes the yelk, obviously bears a strong analogy to the cotyledonous expansion or primary frond of plants; but instead of merely spreading it out in contact with the surface of the nutritive fluid, it forms a cavity which includes it, and thus presents the earliest and simplest appearance of that organ which is peculiar to animals, and characteristic of them,—a digestive cavity or stomach, adapted to contain food, and to absorb by its *inner* surface. Now during the first period of the existence of this germinal membrane, it is composed of nothing but cells. In this respect, therefore, it corresponds with the cotyledon of plants. These cells absorb from the nutritive fluid in contact with them, the materials necessary for the development of the central embryonic structure, and they at first propagate these materials to it by their own permeability alone. At a later period, however, there is formed in the vascular layer of the germinal membrane, a system of vessels communicating with the heart of the embryo, and destined to convey to it the nutriment absorbed by the subjacent cells more rapidly and directly than it was previously supplied. Very satisfactory reasons have been given by Mr. Grainger (Baly's Müller, pp. 1557-60,) for the belief that the *vasa omphalo-mesenterica* are the real agents for introducing the nutrient matter of the yelk into the system of the embryo ; and that this does not pass into the intestines by the vitelline duct, as formerly supposed. They do, in fact, correspond to the mesenteric vessels of invertebrate animals, which are distributed upon the surface of the intestine, and absorb nutriment from its cavity ; since, as just shown, the yelk-bag is the temporary stomach of the embryo ; and, as will presently appear, it remains as the permanent stomach of the radiated tribes. Previous to the ninth day of incubation (in the fowl's egg) a series of folds are formed by the lining membrane of the yelk-bag, which project into its cavity ; these become gradually deeper and more crowded, as the vesicle diminishes in size, by the absorption of its contents. The omphalo-mesenteric vessels that ramify upon the yelk-bag send into these folds (or valvulæ conniventes) a series of inosculating loops, which immensely increase the extent of this absorbent apparatus. But these minute vessels are not in immediate contact with the yelk ; for there intervenes between them a layer of nucleated cells, which is easily washed away. It was from the colour of these, communicated to the layer of vessels beneath it, that Haller termed the latter *vasa lutea ;* when the layer is removed, the vessels present their usual colour.   It appears from Dr. Barry's observations, that the *second* membranous layer given off from the peripheral portion of the nucleus of the embryonic cell, is by no means the final one ; but that successive productions of cells continue to take place in this manner for some time.   As such additional layers are not found, however, in the interior of the vascular layer, it is probable that those first produced must have disappeared ; and it will be found perfectly conformable to the facts presently to be stated (§§ 21-22), to suppose that they have served to elaborate the nutriment supplied by the yelk ; and that they then deliver it up to the absorbent vessels, by themselves undergoing rupture or dissolution, their place being supplied by the new layer formed in the mode just adverted to.

20. In the radiated tribes the yelk-bag remains as the permanent stomach ; and whilst the inner layer of the germinal membrane forms the lining of the cavity, the outer layer composes the integument of the animal. A mouth is formed by the gradual thinning away of the membrane at one end, and tentacula sprout forth around this.   It may be questioned whether any proper vessels ever exist in these animals, but there are certainly intercellular passages along which a circulation of nutritious fluid takes place.   Between these passages and the digestive

cavity, there is a layer of nucleated cells, closely resembling those which form the lining of the bird's egg, and doubtless having the same function, that of absorbing and partially elaborating the nutritive fluid.

NUTRITIVE ABSORPTION.

21. We pass, naturally, from the consideration of the nutrition of the embryo to that of the adult animal.   It has been shown that, in the former, the absorption of the nutritious fluid by cells may be regarded as the preliminary to its introduction into the vessels.   The same may be said of the adult; for, as Mr. Goodsir has recently shown,* there is a continual development of cells at the extremity of each villus, during the period when the lacteals are absorbing chyle.   These cells appear to be the agents by which the *selection* of the nutritious fluid is accomplished, and by which it undergoes its first preparation for the purposes it is subsequently to fulfil.   It is true that the veins also are concerned in absorption; but this is not a *selective* absorption, for they take up anything that is sufficiently soluble in the fluid they imbibe; and this imbibition has been shown to be almost certainly of a simply physical character. On the other hand, the lacteals clearly possess the power of taking up from the fluid in the digestive cavity those portions which can be rendered subservient to the nutrition of the system, and (for the most part at least) of rejecting everything else.   This has always appeared a wonderful power for absorbent *vessels* to accomplish, but when the operation has been shown to be really effected by *cells*, it is seen to be exactly parallel to that which cells perform in those organisms where nothing else than cellular structure exists.

22. The following is Mr. Goodsir's account of the process.   Whilst the process of digestion is going on there is an increased determination of blood to the mucous membrane of the intestinal canal, and " the minute vesicles which are dispersed among the terminal loops of the lacteals of the villus (Fig. 9) increased in size by drawing materials from the liquor sanguinis, through the coats of the capillaries, which ramify at this spot in great abundance.   Whilst this increase in their capacity is in progress, the growing vesicles are continually exerting their absorbent function, and draw into their cavities that portion of the chyme in the gut which is necessary to supply materials for the chyle.   When the vesicles respectively attain in succession their specific size, they burst or dissolve, their contents being cast into the tissue of the villus, as in the case of any other species of interstitial cell.   The looped network of lacteals, continually exerting their peculiar function, take up the remains, and the contents of the dissolved chyle cells, as well as the other matters which have already subserved the nutrition of the villus. As long as the cavity of the gut contains chyme, the vesicles of the terminal extremity of the villi continue to develope, to absorb chyle, and to burst; and their remains and contents to be removed by the interstitial absorbent action of the lacteals.   When the gut contains no more chyme, the flow of blood to the mucous membrane diminishes, the development of new vesicles ceases, the lacteals empty themselves, and the villi become flaccid.   The function of the villi now ceases, till they are again roused into action by another flow of chyme along the gut."   Mr. Goodsir subsequently adds, " The same function is performed, the same force is in action, and the same organ, the cell, is provided for absorption of alimentary matters in the embryo and in the adult, in the plant and in the animal. The spongioles of the root, the vesicles of the villus, the last layer of cells on the internal membrane of the included yelk, or the cells which cover the vasa lutea of the dependent yelk, and, as I have satisfied myself, the cells which cover the tufts of the placenta, are the parts of the organism in which the alimentary matters first form a part of that organism, and undergo the first steps of the organizing process."

23. It is evident, then, that there is no essential difference between the lowest cryptogamic plant and the highest animal, in regard to the act of selective absorption; for in both it is accomplished by cells, which imbibe the nutritive substance that is destined for the growth of the structure; but in the former this is applied

* See Edinb. New Philos. Journal, July, 1842; and British & For. Medical Review, vol. XIV. p. 567.

to their own development alone, whilst in the latter it is speedily given up again by them to the vessels that are to convey it to distant parts, for the renovation of which it is being prepared.

<center>ASSIMILATION.</center>

24. The alimentary materials taken in by the absorbent vessels are not yet in a state fit to be applied to the nutrition of the tissues; for they are in the condition of *chemical* compounds, not yet possessed (in any high degree at least) of *vital* properties. The chief constituents of the chyle, as first absorbed, are albumen and fatty matter; the former is destined to be converted into the material of the solid tissues; the latter is chiefly designed for the maintenance of the animal temperature, by the combination it is afterwards made to undergo with the oxygen introduced through the lungs. It is with the *albumen* that we are at present concerned. This principle cannot be regarded as possessed of any properties which distinguish it from ordinary chemical compounds, save its peculiarity of composition, and its tendency to putrefaction when exposed to the air. In its coagulability by heat or by acids, in its combination with alkalies as an acid, or with acids as a base, and in the absence of the power of spontaneously passing into any forms more decidedly organic than the granules which are seen when it is made to coagulate slowly, it is closely analogous to many substances which belong to the domain of inorganic chemistry. Before it is ready to be appropriated by the tissues as the material for their nutrition, it must undergo a very important change. We find in the blood another principle, *fibrin*, which differs but little from albumen in its chemical composition, but is manifestly endowed with much higher vital properties. One of the most decided indications of this difference is the tendency of fibrin to coagulate when withdrawn from the living vessels; and the appearance of distinct organization in this fibrin, especially when its concretion has taken place in contact with a living surface. (§ 41.) These facts, with many others, appear to indicate that fibrin is the material which is applied to the nutrition of the tissues; and that albumen can only be thus employed after passing through the condition of fibrin. The difference between the two is precisely analogous to the difference between the ordinary mucilage of plants, and that peculiar glutinous sap which is found wherever a formation of new tissue is taking place, and which, like the liquor sanguinis of the animal, is spontaneously coagulable, and disposed to pass of itself into a semi-organized condition.

25. The change from albumen to fibrin is, therefore, the first important step in the process of assimilation. It commences in the absorbent system; for the chyle is found to contain fibrin even before it enters the mesenteric glands; and after it has passed through them the amount of fibrin is much increased. It continues in the blood, for the quantity of fibrin is always kept up in health to a certain standard, although there must be a continual withdrawal of it for the nutritive processes, without a correspondingly regular supply; and it is found to undergo a sudden and remarkable increase under the influence of local causes. What is the cause of this change? It has been usually attributed to some influence effected upon the albuminous fluid by the living surfaces over which it is passing; and the increase in the amount of fibrin in the chyle which is specially noticed after its passage through the mesenteric glands, has been thought due to some peculiar action of the blood that may come into relation with it, through the thin walls of that capillary plexus which forms, with the convoluted lacteal tubuli, nearly the whole bulk of those glands. Perhaps, however, it may be possible to offer a more satisfactory explanation; one, at least, which shall be conformable to phenomena observed in other cases.

26. Several examples have already been mentioned in this Report of the transient existence of cells, that grow, arrive at maturity, and then disappear; apparently without performing any particular function. Thus in the albumen of the seed, this often takes place to a remarkable extent. In the yelk of the egg there is a similar transitory development of cells, of which several generations succeed each other, without any permanent structure being the result. In the germinal vesicle, again, several annuli of temporary cells are seen to occupy its cavity; and

the oldest and largest of these contain another generation; yet all these disappear by liquefaction, as soon as the two permanent cells begin to be developed in the centre. Further, in the subsequent development of all the cells which are descended from these, the same process is repeated, a great number of cells being produced, only to liquefy again as soon as the two central cells make their appearance. Now is it to be supposed that all this *cell-life* comes into existence without some decided purpose? I think the physiologist would not be justified in assenting to such an idea, even if he could assign no obvious reason for the process. But if an object can be assigned, which is conformable to what we elsewhere know of the operations of cells, it may claim to be received as a sufficient explanation, until some better one can be offered. Such an explanation may, I think, be deduced from the foregoing facts, and others of like nature.

27. It has been seen that the first union of the inorganic elements into the simplest proximate principles, is effected by the *cell-life* of plants. The change of these principles into the peculiar compounds which form the characteristic secretions of plants, is another result of their cell-life. And the elaboration of those azotized principles which do not enter into the composition of the vegetable tissues, but which are prepared by them for the nutrition of animals, is another result of the same operation. The change of the mere proximate principles, gum and sugar, into the organizable matter of the nutritious sap, is also partly effected by the cells of the leaves; but we may easily imagine that it is not completed by them, and that a further assimilation is requisite, before the fluid is completely prepared for entering into the composition of a permanent organized tissue. Thus, the starchy fluid which is contained in the ovule, previously to its fecundation, is probably not in the state in which it can be immediately rendered subservient to the nutrition of the embryo; and the development of successive generations of cells, which exert upon it their peculiar vitalizing influence, may be regarded as the means by which the requisite change is effected. Exactly the same may be said of the cells which are developed, in like manner, in the yelk of the egg. The albuminous matter of this is certainly not in a condition in which it can be immediately applied to the purposes of nutrition; and the conversion of it may be regarded as commencing with the development of transitory cells within its own substance, and as being completed by means of the cells forming the inner layer of the yelk-bag. A similar purpose is probably answered by the transitory cells developed within the germinal vesicle, and by those which appear in like manner in the "twin cells," and their descendants. The nutrient materials, which serve for the production of these transitory cells, may not be applicable to cells of permanent character, until it has passed through the former, and been elaborated by them. Such a view derives confirmation from the number of analogous instances, with which the animal and vegetable kingdoms present us, of the production of structures which are to have a merely temporary operation, and to be subservient to the development of permanent organs of a higher character. Now, in the early history of the embryo, as recorded by Dr. Barry, the two cells which are the last-formed product of each parent cell, are organs of the highest importance; and such a preparation may well be supposed necessary for them. It does not take place, however, in the central embryonic cell; a large part of whose nucleus is developed into cells that have a permanent place in the embryonic structure: but the exception only adds force to the general principle; for the development of this nucleus into cells takes place at the expense of nutriment supplied to it by the germinal membrane, which has now spread over the yelk, and performs the office of absorbing and preparing the materials for the development of the embryo.

28. There are other exceptions, which seem to prove the truth of the principle, though in a different mode. The multiplication of cells appears often to take place much more rapidly than by the 2-4-8 process described by Dr. Barry as occurring in the embryonic mass; but, in these instances, the cells are not destined for any but a transitory life. Thus, in the multiplication of the blood-corpuscle, *six* young cells appear to be produced from each parent. A much larger number is probably generated during the rapid growth of vegetable structures, especially those of the

fungus tribe. Thus, the *bovista giganteum* has been known to increase, in a single night, from a mere point to the size of a large gourd, estimated to contain 47,000,000,000 cellules. In such a case it is difficult to suppose that any but the most rapid mode of generating cells could have been in operation; and the idea that these could not have been developed by any such elaborate process as that just alluded to, is borne out by the fact of their extremely transitory character,—the decay of such a structure being almost as rapid as its production.

29. We have thus a class of facts, which indicates that the conversion of the chemical compound into the organizable principle,—such as mucilage into elaborated sap, or albumen into fibrin,—is effected in particular situations by the vital agency of transitory cell-life; that is, by the production of cells which are not destined to form an integral part of any permanent structure, but which, after attaining a certain maturity, reproduce themselves, and disappear,—successive generations thus following one another, until the object is accomplished, after which they altogether vanish. We shall now consider another class of facts, which seems to indicate that the same change is continually being effected in the chyle, lymph, and blood of animals, as well as in the proper juice of plants; by cells, which are either carried about with it, or which are developed for the purpose in particular situations.

30. In chyle drawn from the lacteals near the intestinal tube, there is but little appearance of organization, very few chyle-corpuscles being here seen; but a large amount of very minute molecules, having apparently a fatty character, are diffused through it.* In the chyle of the mesenteric glands, the corpuscles are extremely numerous; and they are always readily seen in the chyle of the central lacteals, and of the receptaculum chyli and thoracic duct; although their number is considerably less than in chyle drawn by pricking the lacteals of the mesenteric glands. The average size of these corpuscles is about 1-4600th of an inch; but they vary from about 1-7000th to 1-2600th. They are evidently imperfectly-formed cells, which are frequently seen to contain two or three central molecules, or a granular matter, especially after they have been treated with water, and which usually exhibit the appearance of a single round nucleus when treated with dilute muriatic acid: but in the largest corpuscles, obtained from the thoracic duct, the addition of acetic acid sometimes discloses three or four central particles, similar to those which may be frequently seen by the aid of this acid in the white globules of the blood; such corpuscles may, I think, be considered as in the act of producing new cells. This idea is confirmed by the fact communicated to me by Mr. Gulliver, that the central particles of the larger chyle-globules, like the same nuclei of the colourless globules of the blood, are rather larger, more distinct, and disc-like, than the central molecules of the common-sized chyle and lymph-globules. Now the first appearance of these cells in large number is exactly coincident with the first appearance of fibrin in the chyle, to an amount sufficient to produce spontaneous coagulation; and when this fact is connected with those which have been previously stated, the inference seems very probable, that the elaboration of the fibrin is a consequence of the production of these cells, and of their vitalizing influence upon the albumen.

31. With regard to the origin of these cells, there is ample room for difference of opinion. Among the minute particles contained in the chyle of the peripheral lacteals, some appear to be (from their solubility in ether) of an oily character;†

* See Mr. Gulliver's observations on the chyle, &c. in Appendix to translation of Gerber's General Anatomy, pp. 88-94.

† That the molecular base of the chyle may be of an oily nature, there is reason to believe from Mr. Gulliver's observations (Note to Gerber, p. 56); but the remarkably uniform, grayish ground, which this base presents in the field of vision, the singular uniformity in the size of the constituent molecules, their ready disappearance on the addition of a small quantity of cold ether to the fluid chyle, and the appearance in this mixture of a fluid matter, as described by Dr. Rees, would indicate that the molecular base must be either a peculiar variety of fatty matter, or this matter in a peculiar condition,—perhaps in the form of an emulsion, so fine and impalpable that nothing similar has yet been detected in any other animal fluid. The larger, more unequal-sized, and highly refracting oily globules of the chyle are in a very different state, and so are those of milk or cream.

whilst others are albuminous. It is considered by Wagner that the latter are the germs of the chyle-cells; and I have little doubt that this idea is correct. These reproductive granules, however, must have been produced by some previously-existing cell; and their most probable origin appears to me to be the cells already mentioned as the *selectors* of the chyle at the extremities of the villi. These cells, in bursting or liquefying, yield both their fluid contents, and their reproductive granules, to the absorbent vessels; and in these vessels the chyle appears destined to undergo a gradual alteration, under the influence of that cell-life of which the foundation is laid at the first reception of the fluid into the system. The development of these cells, and the production of their peculiar effects, require a certain time; this is provided for by the delay of the chyle in the lacteal vessels. In the lower vertebrata, there are no mesenteric glands,—a circumstance which indicates that these are not an *essential* part of the absorbent system; but, in such animals, the absorbents are immensely extended in length. In the warm-blooded vertebrata, in whose conformation the principle of concentration operates to the greatest extent, we see no such prolongation; but it is provided for by the excessive convolution of the vessels in the mesenteric glands, where it seems probable that the chyle is delayed during the development of its characteristic cells.

32. Statements of a precisely similar kind may be made, regarding the lymph and its corpuscles. Reasons have been elsewhere given by the author, for regarding the lymph, not as a fluid destined to be thrown out of the system, but as the product of that secondary digestion, by which a portion of the materials, that have formed a component part of the tissues and have been set free by their disintegration, are again rendered subservient to nutrition, and are reconveyed into the current of the circulation. (See Principles of Human Physiology, §§ 465-67.) One thing appears certain,—that, with the exception of fatty matter (of which the chyle contains a large amount, whilst the lymph presents scarcely a trace of it), there is little appreciable difference between the chyle and the lymph. The latter, like the former, contains albuminous matter, part of which undergoes a gradual transformation into fibrin; and there is precisely the same evidence as in the former case, that this change is effected by the development of cells in the fluid. The idea which we should hence form, that the lymphatic glands are organs of nutrition, in which the matters passing through them are subjected to an elaboration which prepares them for the growth and maintenance of the animal structures, entirely agrees with Mr. Gulliver's observations. (See Appendix to Gerber, pp. 97-8.)

33. The continuation of this process in the blood has been regarded by Wagner, Henle, and Wharton Jones, as one of the functions (probably the chief one) of the *red* corpuscles. To this view, however, there are certain objections, which appear to the author to be of a very decided character. In the first place, there is no constant proportion between the amount of fibrin in the blood, and the number of its red corpuscles. The researches of Andral have clearly shown, that in the inflammatory condition of the blood there is a decided increase, often a most astonishing one, in the amount of the fibrin; whilst there is no corresponding augmentation in the number of red corpuscles. Indeed, this augmentation is not incompatible with a chlorotic state of the blood; the peculiar characteristic of which is a great diminution in the amount of red corpuscles. Again, in fever, the characteristic alteration in the condition of the blood appears to be an increase in the amount of red corpuscles, with a diminution in the quantity of fibrin; yet if a local inflammation should establish itself during the course of a fever, the proportion of fibrin will rise, and this without any change in the amount of corpuscles. By such alterations, the normal proportion between the quantity of fibrin and corpuscles, which may be stated as $a : b$, may be so much altered as to become $4a : b$, or $a : 4b$. Can it be supposed, then, that the elaboration of the fibrin is a consequence of the action of the red corpuscles? Another important fact, having the same bearing, has been ascertained by Remak. He found that, when an animal is bled largely and repeatedly, the quantity of red corpuscles in its blood is greatly diminished, whilst the proportion of the colourless corpuscles is increased; now, as it has been ascertained by Andral's investigations that the quantity of fibrin is but little af-

fected by bleeding, it would seem that the white rather than the red corpuscles are the agents of its elaboration.

34. Again, there appears to be a total absence in the blood (?) of invertebrated animals of any red corpuscles * resembling those of the blood of vertebrata; yet in this fluid the elaboration of albumen into fibrin must be taking place, for the nutrition of the tissues, as in the higher animals. It is true that their nutritious fluid contains globules; but these globules bear a much stronger resemblance to the corpuscles of the chyle, or to the colourless corpuscles of the blood, than they do to the red corpuscles of the vertebrata. So well marked is this resemblance, that, as Wagner † himself has suggested, the circulating fluid of the invertebrata is to be considered as rather analogous to the chyle than to the blood of vertebrated animals,—a doctrine which appears to the author extremely probable.

35. These two objections seem of themselves sufficient, in the absence of any affirmative evidence, to overthrow the hypothesis that the elaboration of fibrin is the act of the *red* corpuscles. But there is another class of blood-particles, to which increased attention has recently been directed, and in regard to whose function the very same evidence with that just produced weighs strongly in the affirmative. These are the *colourless* corpuscles or *lymph*-globules. The former term I prefer, as expressing their distinctive appearance; the latter involves the supposition that they are identical with the corpuscles of chyle and lymph, which cannot be regarded as yet demonstrated, though it appears to me highly probable. There is a remarkable uniformity in the size and appearance of these in all vertebrate animals, notwithstanding the immense difference in the size of the red corpuscles. The colourless corpuscles have not yet been observed to vary much from the diameter of 1-3000th of an inch; whilst the red corpuscles vary from less than 1-12,000th (musk-deer) to 1-337th (Proteus) of an inch. Moreover, in very young embryos of Vertebrata (as I learn from Mr. Gulliver) the white globules are nearly as numerous as the red particles. This Mr. Gulliver has often seen in fœtal deer, about an inch and a half long. In a still smaller fœtus the blood was pale from the preponderance of the white globules; and in such embryos the coloured corpuscles have a very distinct pale globular nucleus. It is therefore a fact of much interest, that, even in the mammiferous embryo, at the period when growth is most rapid, the blood has a strong analogy to that of the invertebrata. It is then, too, most analogous to chyle; since it consists of the fluid elaborated from the organizable matter supplied by the parent, and directly introduced into the current of the circulation. The function of the placenta is double; for it is at the same time the medium of introducing into the circulating fluid of the fœtus the alimentary materials supplied by the parent; and of aerating the fluid which has traversed the fœtal system. It is not until the lungs and digestive apparatus of the embryo have commenced their independent operation, that the distinction between its blood and its chyle becomes manifest. We should expect to find in the blood of the fœtus, therefore, up to the time of birth, a large proportion of white corpuscles; and this circumstance has been noticed by Dr. Barry (and communicated to me by him) with regard to the blood of the umbilical vessels of a placenta which he had the opportunity of examining very shortly after its expulsion. The fact was regarded by Dr Barry as indicating that the production of the colourless corpuscles of the blood is independent of the chyle-globules; but I am disposed to interpret it in exactly the opposite manner; since, as I have shown, the placental blood has considerable analogy to the circulating fluid of the invertebrata, which have no lacteals, and may be considered, therefore, as partly representing the chyle of the adult vertebrated animal. The colourless corpuscles are the kind of globules *most universally present* in the circulating fluid; for whilst the red particles are confined to vertebrata, the former are found in the circulating fluid of all animals, even where there are no distinct vessels.

36. A very interesting observation has recently been published by Mr. Addison,

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* The red-blooded annelida do not form an exception to this rule. The colouring principle of their circulating fluid exists in its *plasma*, not in globules.

† Physiology, translated by Willis, p. 278, et seq.

(Prov. Med. and Surg. Journ. Aug. 20, 1842) which appears to the author to throw great light on the much-disputed question of the digestive apparatus of the polygastric animalcules. The numerous globular particles generally to be seen in their transparent bodies, but becoming more numerous and distinct when the animalcules have been recently feeding, are regarded by Ehrenberg as stomachs, opening out of an intestinal tube. This account of them has been objected to by other observers, on the ground, that these particles are seen to undergo a regular movement, as if they were floating in the midst of a fluid filling the general interior cavity of the body, and that they are sometimes discharged through the anal orifice. Of the validity of this objection, the author's own observations have satisfied him. It is stated by Mr. Addison that, when a polygastric animalcule is touched by liquor potassæ, its body bursts, and liberates the so-called stomachs, which are evidently destitute of any structural connexion with it; these corpuscles, when they come under the influence of the same reagent, themselves swell and burst, discharging a number of minute granules; and thus undergoing precisely the same change as that which is effected in the colourless corpuscles of the blood by the alkaline fluid. I cannot doubt that these particles are cells which float in the fluid of the body, and elaborate the materials for its nutrition, in the same manner as do those of the chyle and blood of higher animals.

37. The presence of colourless corpuscles, sometimes to a large amount, in the blood of reptiles, has long been known; since their rounded form and comparatively small size enables them at once to be distinguished from the large oval nucleated red corpuscles of these animals. They bear so strong a resemblance in mammalia, however, to the red corpuscles of the blood, both in size and figure, that their existence, at least to any similar amount, has not been generally recognized. There can be no doubt, however, that they perform as important a function in the blood of mammalia as in that of reptiles; and several facts of the same kind, which have been recently observed, seem to indicate the nature of this function with much probability. It has been (in my opinion at least) satisfactorily ascertained by the observations of Mr. Gulliver, (Philos. Mag. Sept. 1838) and others, that the usual amount of colourless corpuscles in the blood is very much increased at the time when an increase of fibrin is taking place,—that is, in the inflammatory condition; and according to the observations of Remak, Barry, and Addison, the buffy coat usually contains a large number of them. Their increase appears to have some relation with the local inflammatory change; for they are particularly abundant in the blood of inflamed parts, as noticed by Mr. Addison in that drawn by the prick of a needle from a pimple, the base of a boil, the skin in scarlatina, &c.; and they may be seen to accumulate in the vessels of the frog's foot, on the application of stimuli to the part. A corresponding multiplication of the colourless corpuscles takes place in several other instances, in which the formative processes are peculiarly active, and in which the demand for fibrin must therefore be greatly increased. Thus the buffy coat of the blood of pregnant women contains a very large number of them. It is stated by Wagner, (Op. cit. p. 245,) that the number of colourless corpuscles is always remarkably great in the blood of well-fed frogs just caught in the summer season; and that it is very small in those that had been kept long without food, and in those examined during the winter. Their large proportion in the embryo, and gradual decrease as the formative processes become less active, has been already noticed (§ 35).

38. The very facts, therefore, which tend to prove that the *red* corpuscles do not perform the elaboration of the organizable plasma, are equally cogent in favour of the doctrine that this function is to be attributed to the white or *colourless* corpuscles; and this view is borne out by other facts, which indicate that there is a decided relation between the *colourless* corpuscles and the *nutritive* or organic life of the tissues; and a corresponding relation between the *red* corpuscles and their *functional activity.* All observers who have studied the capillary circulation with attention, agree in the statement, that there is a marked difference in the movements of the two classes of corpuscles; the white corpuscles rolling slowly along in the almost motionless layer of plasma which lines the capillaries, whilst the red

particles are carried briskly onwards in the centre of the stream. It is difficult to avoid the inference that (to use the words of Mr. Wharton Jones) "there is some reciprocal relation between the colourless corpuscles and the parts outside the vessels, in the process of nutrition." On the other hand, that the presence of the red particles has an important influence in maintaining the excitability of organs, especially the nervous and muscular systems, has long ranked as a physiological truth; and it is fully explained on the principles which Liebig has propounded, with reference to the necessity for oxygen in the active vital operations of the tissues, and the share taken by the red corpuscles in carrying it through the system. Of these views, an account was given in the last Number of this Journal (pp. 499, 521); and it is therefore unnecessary to do more than state here, that Liebig regards a certain disintegration of the tissue as the means of manifesting its vital force, or peculiar property; for this disintegration, the presence of oxygen is requisite; and the oxygen taken in at the lungs is carried through the system chiefly (but not entirely) by the red particles of the blood entering into a chemical combination with their protoxide of iron, which gives place in the systemic capillaries to another,—the oxygen being there set free, and replaced by carbonic acid, which is again exchanged for oxygen in the lungs. That the proportion of red corpuscles in the blood bears a distinct relation to the nervous and muscular energy of the animal, and to the amount of oxygen consumed by it, has long ranked as a physiological fact. An exception might be pointed out in regard to insects, which have no red corpuscles, and yet can display a greater amount of animal energy, and may consume a larger quantity of oxygen in proportion to their size, than beings of any other class whatever. But here, as elsewhere, *exceptio probat regulam;* for the conveyance of oxygen through the tissues is not in them accomplished by the circulating fluid, which has a comparatively sluggish movement, but is effected more directly by the ramifying tracheæ which introduce air into the minutest portions of the structure.

39. It now remains for us to inquire into the origin of the red and colourless corpuscles of the blood. With respect to the first appearance of the former, there is now but little doubt. They are developed from the interior of certain of the cells of the vascular area, the cavities of which cells are fused into each other by the rupture or absorption of their walls, so as to become vessels. That they are subsequently in a continual state of decay and renovation also seems well established; but in regard to the *mode* of this renovation, a question arises, whether they are generated by a change in the chyle and lymph-corpuscles, or whether the new red particles take their origin in the old ones. The former is the opinion of Wagner and many other eminent German physiologists; the latter doctrine was first brought prominently forwards by Dr. Barry, though Leeuwenhoek and other observers after him had entertained it. Although the idea of the origin of the red corpuscles from the chyle-globules has a certain degree of plausibility, with regard to reptiles, in which the chyle-globules have nearly the same diameter with the nuclei of the red particles, it seems totally inapplicable to mammalia, in many of which the red particles are smaller than the chyle globules. Moreover, the appearances which are recorded in support of this doctrine do not show more than that an alteration may take place in the size and form of the chyle-globules, by which their character as nucleated cells becomes more apparent; that these nucleated cells are to become red corpuscles is a matter of supposition only. The author is inclined, by these considerations, as well as from his own observations, to consider Dr. Barry as correct in his statement, that the blood-corpuscles are continually reproducing themselves in the same mode as do other cells; new vesicles being developed from their nuclei, which increase and distend the parent-cell, being at last set free by its rupture or dissolution.

40. Regarding the origin of the colourless corpuscles there is a similar diversity of opinion; by Müller and many other physiologists, they are considered to be identical with the lymph- and chyle-corpuscles; and to this view the author is himself inclined. It is a very strong argument in favour of it that they are of nearly the same size and appearance in all animals that have yet been examined;

and that they correspond very closely, not only in these respects, but in the mode in which they are influenced by reagents. There does not seem any greater difference between the colourless corpuscles of the blood and the chyle or lymph-globules, than there is between chyle-globules taken from different parts of the lacteal system. On the other hand, Dr. Barry and Mr. Addison agree in the opinion that the colourless corpuscles are formed from the central portion of the red discs; and they consider them as holding an intermediate position between the true red discs and those greatly altered forms of them which constitute (according to them) the foundations of the tissues, as well as pus- and other globules. It does not appear to the author that the facts stated by either of these observers are sufficient to establish a position so much at variance with known facts. There seems as much difficulty in imagining that the colourless corpuscles of the Frog should have originated from its comparatively *large red* corpuscle,* as that the minute red corpuscle of the Musk Deer should have had its origin in the comparatively large lymph-globule of that interesting animal.† The circumstance that colourless corpuscles exist abundantly in the blood of the fœtus, which has no separate chyle, does not weigh in the least against the doctrine of the identity of the chyle and colourless corpuscles; since the fluid taken up by the omphalo-mesenteric vessels from the surface of the yelk-bag, or from the placental sinuses by the umbilical vessels, stands precisely in the same relation as chyle. The cell-germs of the former are probably furnished by the cells that intervene between the omphalo-mesenteric vessels and the surface of the yelk; those of the latter by the similar layer of cells that covers (according to Mr. Goodsir's observation) the extremities of the absorbent tufts of the umbilical vessels (§ 22).

NUTRITION.

41. The term nutrition may be not improperly limited to the act by which the organizable plasma is converted into solid tissue. This fibrinous plasma is prepared for organization by the assimilating process just described; and if withdrawn from the interior of the living body, it spontaneously passes into a state which presents a definite organization. Hence, the coagulation of fibrin is clearly not the result of its *death,* as was formerly supposed; for this coagulation is the first stage of its organization, when plastic lymph is poured out on a living surface; and even when the process takes place after the complete withdrawal of the fluid from the living body, a fibrous arrangement, as distinct as that which is presented by fibrin coagulated in the living body—up to the time when vessels appear in the newly-forming tissue, is seen in the clot. The fibres may form by their interlacement an areolar tissue; or by their parallel arrangement a distinct membrane. This fact has been noticed by various observers from the time of Haller; but it has been overlooked by many recent physiological writers, and particular attention has lately been directed to it by Mr. Addison and Mr. Gulliver. The former has studied the fibrous arrangement in the act of being formed in the buffy coat; and he has remarked that corpuscles are included in its areolæ, which he believes to be identical with the colourless corpuscles of the blood. Mr. Gulliver has pointed out the same appearance in thin slices of ordinary coagula rendered hard by boiling:‡ and here, too, there are interspersed among the fibres pale corpuscles, which are termed by Mr. Gulliver "organic germs," as well as bodies that resemble nuclei of similar corpuscles. The same arrangement of fibres has been shown by Mr. Gulliver to exist in the false membranes which are produced on inflamed serous surfaces, by the more or less complete organization of fibrinous exudations. In such situations, the fibres are mingled with corpuscles, (termed by other authors "exudation cells,") which seem to be the same "organic germs" in an altered condition.|| These

* Dr. Barry has informed the author that he feels well assured of this transformation; but it cannot be the same with that which produces the colourless corpuscles of the mammalia.

† See Mr. Gulliver's observation, in Willis's Translation of Wagner's Physiology, p. 251, note.

‡ See note by Mr. Gulliver to p. 31 of Gerber's General Anatomy.

|| See Mr. Gulliver's contributions to the Minute Anatomy of Animals, Part iv. Philos. Magazine, Oct. 1842.

corpuscles may form a larger or smaller proportion of the exudation ; if they are merely scattered amongst the fibres of the coagulum, and the chief part of it be composed of hardened fibrin, the membrane will be tough ; but if the exudation be chiefly composed of these corpuscles, with but a small amount of fibres between them, the membrane will be quite friable, and will approach towards the character of a purulent exudation.

42.   The fibrous aggregation of the particles of fibrin seems, therefore, to be the real process of coagulation, whether upon a living or a dead surface.   By Dr. Barry it is imagined that the appearance of fibres in the coagulum is due to the rupture of some of the blood-discs in which he believes fibres to be generated, and the consequent escape of the latter ; but it seems to be forgotten by him that fibrin will coagulate without any blood-discs,— as when the latter are separated by filtration, according to Müller's celebrated experiment upon frog's blood,—or when the chyle, in which no blood-discs are to be found except by an accidental admixture, is withdrawn from the thoracic duct.   Moreover, as Mr. Gulliver's figures, (Gerber's Anatomy, Figs. 244-6,) all copied accurately from nature, clearly show, a small portion of coagulated fibrin contains a far larger number of fibres, than we can imagine to be contained in the number of blood-discs that would fill the same space.   The author has lately discovered a very interesting example of a membrane composed almost entirely of matted fibres, which so strongly resembles the delineations of fibrous coagula given by Mr. Gulliver, that he cannot but believe in the identity of the process by which they are produced. This is the membrane inclosing the white of the egg and forming the animal basis of the shell.   If the shell be treated with dilute acid a tough membrane remains, exactly resembling that which lines it ; and if the hen has not been supplied with lime there is no difference between the two membranes even without the action of acid on the outer one.   Each of these membranes consists of numerous laminæ of most beautifully matted fibres intermixed with round bodies exactly resembling exudation cells.   It is in the interstices of these fibres that the calcareous particles are deposited which give density to the shell; these membranes are formed around the albumen which is deposited upon the surface of the ovary during its passage along the oviduct, from the interior of which the fibrinous exudation must take place.   All these facts clearly indicate, that for the reparations of injuries, *inflammation* is not an essential change; since the ordinary fibrin which is continually being applied to the purposes of nutrition, is capable of passing spontaneously into the organized condition, and thus of forming a regular tissue, for the more complete organization of which, nothing is required but the extension of vessels into it from the subjacent surface.   Thus a strong confirmation is afforded to Dr. Macartney's doctrine, that the reparation of injuries is best effected by a process resembling the ordinary nutrition of the tissues ; and that our therapeutic efforts should be directed to promote this, and to keep down inflammation.

43.   The doctrine of Schwann respecting the development of fibrous as well as other tissues from cells appears to require some modification, since we thus see fibres produced by the simple consolidation of the plasma without an intervening development of cells.   Yet if the preceding doctrines be correct, the agency of cells is still required for their production, though in an entirely different mode ; since the fibrinous plasma in which the fibres originate is itself elaborated by the cells floating in the circulating fluid.   The same remark applies to the other instances in which a tissue appears to be produced without the intervention of cells. Thus the essential part of a mucous membrane, according to Bowman and Goodsir, is a delicate structureless lamella ; in the production of which cells appear to have no concern.   A similar homogeneous membrane forms the lining of the arteries ; but the membrane contains minute particles, which appear to be the germs of the epithelium-cells that are to be developed on its surface.   A continual supply of such germs must be required where the epithelium-cells are being constantly thrown off, as is the case with those of the stomach and intestinal canal and with secreting surfaces in general.   These germs or reproductive granules have probably been prepared by those *assimilating cells*, the influence of which on the plasma has prepared it to pass into the condition of membrane.

44. There can be no doubt, however, that the function of the plasma or liquor sanguinis is, in general, to supply the material for the nutrition of the previously-formed tissues,—that is, for the reparation of their waste, by the production of new tissues like their own. As to the mode in which this is accomplished there is much that is still very obscure, notwithstanding the recent vast increase in the amount of knowledge on the subject. It is certain that a large proportion of the tissues are produced in the embryo, from the cells of which alone it is composed at an early period; these cells undergo various kinds of metamorphoses, the nature of which will be detailed in a future report. But, according to Dr. Barry, many of these tissues which make their appearance in the midst of others,—the crystalline lens for example,—originate in cells which he believes that he can trace back to the *red* corpuscles of the blood. Regarding the validity of this statement, materials are yet wanting for a positive decision; for those which Dr. Barry's paper contains can scarcely be regarded as decisive. The origin of tissues from the *colourless* corpuscles appears to be a much more probable supposition. The "exudation cells" which are found in the lymph effused on cut surfaces, and the pus-globules into which these may be converted by the action of air or other causes, bear so strong a resemblance to the colourless corpuscles, that it is difficult to refer them to any other origin. This, indeed, is the view of their nature entertained by Barry and Addison; and it is only by referring the colourless corpuscle itself to the red particle that they can trace back the greater number of tissues to the latter; the colourless corpuscles being in their view an intermediate stage of development between the ordinary red particles and the first cells of newly-forming tissue. The determination of this last question is a work that cannot be accomplished, except by an extensive series of observations carried on through a great range of species.

45. But even supposing that the *origin* of any mass of tissue should be traced back to either kind of the cells that are floating about in the blood, we are not thence to decide that the *continued nutrition* of the tissue is performed in the same manner. The muscular fibre once formed, may be able, for anything that we know to the contrary, to produce the germs of other fibres, by the materials elaborated from the blood, without any direct supply of cells or fibres from it. We *know* this to be the case in regard to cartilage, the cells of which are continually undergoing increase by a process of multiplication exactly conformable to that which takes place in the early state of the embryo; and we know that this tissue is not supplied with blood in any other way than by the transudation of the plasma through its substance. Again, on the surface of mucous membranes there is a continual new development of epithelial cells; these can scarcely be altered blood-corpuscles, as Barry and Addison consider them to be, since bodies of such large size could not make their way through the basement membrane without sensible pores, which certainly do not exist. There seems little doubt that the rapid renewal of the epithelium-cells, which is continually taking place on many of the mucous surfaces, is due to the development of germs contained in the basement membrane at the expense of the fluid brought to its attached surface by the vessels ramifying beneath it. That Dr. Barry and Mr. Addison should see a strong resemblance between blood-corpuscles and incipient epithelium-cells is not surprising, when it is considered how much alike *all* cells are in some or other of their stages of production; and when the *impossibility* (for such it clearly appears) of this transformation is considered, much doubt is necessarily cast on the validity of the other inferences of those observers. If *similarity* alone is to be taken as a proof of *identity*, then the identity of the chyle and lymph-globules with the colourless corpuscles of the blood is a necessary inference.

46. The foregoing observations are not intended to express any decided opinions on the subject of the formation of the tissues; since the whole question appears to the author to be at present *sub judice*. In his own mind, however, there is a decided preponderance of evidence in favour of the opinion, that the perpetual reproduction of tissue which constitutes the act of Nutrition, is due to the development of cell-germs in the tissues themselves, at the expense of the fibrin of the blood; and that the use of the *white* corpuscles (of which the analogues

are found in the circulating fluid of all animals) is to elaborate that fibrin ; whilst the function of the *red* corpuscles (whose office must be of a more special nature, since they are only to be found in vertebrata,) is to serve as the carriers of oxygen and carbonic acid. But the determination of it has no importance in regard to the principle which is developed in this report. Whether or not it be true that the tissues have their origin in the red corpuscles of the blood, as Dr. Barry maintains, they are developed by the agency of cells ; and these cells are descended, more or less remotely, from those of which the foundations were deposited in the germinal vesicle by the act of fecundation. The doctrine of cell-life is as true, therefore, when applied to animal as to vegetable nutrition.

SECRETION.

47. There can scarcely be a more beautiful illustration of the doctrine, that physiology is as capable as any other science of being reduced to general principles, and that these principles must, if valid, be of *universal* application, than the fact that the process of secretion is performed, in animals as in plants, by the agency of *cells ;* and that however complex the structure of the secreting organ, these simple bodies constitute its really operative part. The progress of comparative anatomy had shown that neither its form nor its internal arrangement could have any essential connexion with the nature of its product; since even those glands (the liver and the kidney for example) in which there is the greatest peculiarity of structure, make their first appearance in the simplest possible form. Still something was wanting to prove that the structural elements immediately concerned are in all instances the same ; and there seemed no analogy whatever between the secreting *membrane* of the animal and the secreting *cell* of the plant. The doctrine was first propounded by Purkinje, adopted and extended by Henle, and fully confirmed by the interesting researches of Goodsir and Bowman, that true *secretion*—that is, the elaboration from the blood of certain of its solid contents, which previously existed there in a form more or less different from that in which they afterwards present themselves—is always performed by the intervention of cells ; which, as a part of their regular vital actions, withdraw these ingredients from the blood and afterwards set them free by their own rupture or dissolution. The process is thus strictly analogous to that of nutrition; since *every* cell, in the progress of its development, forms certain peculiar products out of the alimentary materials supplied to it ; and just as the cells at the extremities of the the villi select from the chyme the nutritive portion which is to be introduced into the absorbent vessels, so do the cells that line the secreting tubuli select from the blood the effete particles it is *their* peculiar province to assimilate, and discharge them into the canals by which they will be carried out of the system. As Mr. Goodsir very justly remarks, "There are not, as has hitherto been supposed, two vital processes going on at the same time in the gland, growth and secretion ; but only one, viz. growth. The only difference between this kind of growth and that which occurs in other organs is, that a portion of the product is, from the anatomical condition of the part, thrown out of the system." (Transactions of the Royal Society of Edinburgh, vol. xv., p. 302.)

48. There cannot be a better illustration of this view than the nature of *fat*, the production of which is exactly the intermediate link required to connect the two processes. The adipose tissue consists of cells, by the action of which the fatty matter is elaborated from the blood ; instead, however, of being thrown out of the system, it remains stored up in their cavities until it is required for use within the body ; and it must then be taken into the circulation by a process resembling the first absorption of aliment. Now a certain proportion of fatty matter is normally found in the secreting cells of the liver, and this quantity may be very much increased, as Mr. Bowman has shown, especially in diseases which obstruct the pulmonary circulation. The fat elaborated by *these* cells is destined to be thrown off from the system ; and thus we perceive how much the anatomical position of the cells has to do with the result. Mr. Gulliver has communicated to me an interesting observation on the state of the secreting cells of the liver in jaundice, as witnessed by him in two cases. They were found to contain an unusual quantity of biliary matter, (easily

distinguished by its colour) which was collected chiefly around the nuclei, but was also scattered throughout the cell. Some of the cells were nearly opaque from the great quantity of biliary matter contained in them. In healthy cells of the liver the same appearance is not seen; for they are of a light brown colour and almost transparent. It would be interesting to examine the state of the hepatic cells, in those cases in which there is not a retention but a suppression of the secretion. Another interesting example of abnormal secretion has been mentioned to me by the same industrious observer. On examining the so-called *piogenic membrane* lining a chronic abscess, he found it to consist of pus-like globules, strongly resembling the colourless corpuscles of the blood, with minuter molecules, and united by fibrinous fibrils, altogether very much like the false membrane which he has depicted as lining a tuberculous cavity (Philosophical Magazine, Nov. 1842). The contents of the abscess were common pus, mixed with a considerable quantity of fibrinous matter in masses of variable size,—the concrete or lardaceous pus of the French. The *secretion* of the purulent fluid, therefore, takes place in such instances from a membranous surface chiefly composed of cells analogous to those which are present in the *liquor puris* in greater or less amount.

49. The production of cells, as an integral part of the normal process of secretion, has been demonstrated by Mr. Goodsir in a considerable variety of instances (Figs. 11-13); and he has further shown that what is ordinarily termed an *acinus* is nothing more than a parent-cell filled with progeny. (Fig. 14.) This statement may also, as appears from late researches, be applied to the lungs, in which the air-tubes do not terminate, as maintained by Reissessen and his followers, in single dilated cæca, but open into a system of communicating beaded canals, forming a kind of acinus. These beaded canals are evidently composed of cells partly fused together; and by the comparison of their state in animals of different ages, it seems that they are all developed from the cell in which the air-tube terminates, and that they continue to increase in number from the period of birth to adult age. The fact already stated, respecting the function of the red corpuscles of the blood and their connexion with the respiratory function, supplies the required proof that respiration takes place through the medium of cells. But it may be questioned whether such agency is necessary where, as in insects, the air comes into more immediate contact with the blood; the change being of a chemico-physical character, and not truly vital.

50. The structure of the testes also, and the nature of their product, have an interesting connexion with the structure and functions of the ordinary secreting organs. It was ascertained by Wagner that the most characteristic portion of the testes, throughout the animal kingdom, are the cells in which the spermatozoa are generated. These cells are found among the lower animals to lie in the midst of other tissues, and to set free their products by rupture, just as do their secreting cells. In the higher animals the process cannot be so well observed, since the cells lie in a testis of more complex construction, which seems destined to form some other secretion; but still it takes place in a manner essentially the same; and thus the proof is complete, that in the animal, as in the plant, the organic functions are all performed through the agency of cells.

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EXPLANATION OF THE PLATE.

FIG. 1. An ovum prepared for fecundation, from the ovarium of a Rabbit in heat. The germinal vesicle, *c*, contains numerous concentric layers of cells, which have been successively formed at the margin of the germinal spot; the altered state of this is seen at *b*. The germinal vesicle is surrounded by a mass of cells, *d*, in each of which a corresponding process is taking place; these are indistinct, and appear to be undergoing liquefaction, beneath the zona pellucida, *f*. (§ 12.)

FIG. 2. Plan of the structure of one of the parent-cells of the substance surrounding the germinal vesicle; this is seen to contain several concentric layers of

young cells, in the outermost and oldest of which a similar set of changes is going on.   (§ 12.)

Fig. 3. A fecundated ovarian ovum of the Rabbit, five hours and a half after copulation.   The germinal vesicle, *c*, filled with cells, appeared to be returning to the centre of the ovum. A distinct cleft appears in the part of the zona pellucida, *f*, just above the spot it had quitted.   (§ 13.)

Fig. 4. A fecundated ovum twenty-four hours and a half, from the fallopian tube.   Two new cells, *b*, are now seen in the midst of those which previously filled the germinal vesicle, and which are now beginning to liquefy; all the cells of the yelk have undergone liquefaction, except two marked *d*.   (§ 13.)

Fig. 5. An ovum of twenty-four hours and a half from the fallopian tube, more advanced than the last.   The twin cells, *b*, now occupy nearly its whole interior, and are filled with new cells, of which two are destined permanently to replace each.   All the previously formed cells have undergone liquefaction.   (§ 13.)

Fig. 6. Cells from the group which originates in the twin cells; in one of them are represented the two cells that will succeed it, themselves beginning to undergo the same series of changes.   (§ 17.)

Fig. 7. An ovum of sixty two hours, from the uterus, showing the "mulberry mass" of cells which has originated from the twin cells, *b*, of Figs. 4 and 5.   The ovum is now enveloped in the chorion, between which and the zona pellucida there is a considerable amount of fluid.   (§ 17.)

Fig. 8. An ovum of 102½ hours from the uterus, showing (on a smaller scale) a much later stage in the development of the germinal structure.   The mulberry mass, *b*, has reached the side of the ovum; and such a change in its arrangement has taken place, as to bring into view the central cell, *a*.   Within this is seen its large annular nucleus, surrounded by the pellucid area.   The margin of the mulberry mass has spread itself over the interior of the zona pellucida, forming the membranous expansion, *c*, which is ordinarily known as the serous layer of the germinal membrane. (§ 18.)

The preceding figures are all copied from the delineations accompanying Dr. Barry's Embryological Researches. The succeeding are from Mr. Goodsir's.

Fig. 9. Extremity of a villus during the absorption of chyle; the absorbent vesicles at its extremity are distended with chyle; and the trunks of its lacteals are seen through its coats. (§ 22.)

Fig. 10. Two follicles from the liver of the crab. The colourless germinal spot is at the blind extremity of the follicle. The secreting cells become distended with bile and oil as they recede from the germinal spot.

Fig. 11. Secreting cells from the liver of the Limpet. The bile is contained within the secondary cells, which occupy part of the cavity of the parent-cell.

Fig. 12. Secreting cells from the kidney of the Snail. The contained secretion is dead white, and presents a chalky appearance.

Fig. 13. Secreting cells from the mamma of the Bitch, containing milk-globules.

Fig. 14. Progressive stages in the development of the testis of Squalus cornubicus (Porbeagle); *a*, portion of duct, with nucleated cells attached to its walls; *b*, one of these cells more developed and containing young cells within it, now altogether constituting an acinus; *c* and *d*, more advanced stages of the primary cell; *e*, secondary cells beginning to assume a cylindrical form; *f*, this change completed; *g*, secondary cells, one in its first state with a composite nucleus, another elongated into the cylindrical form and containing spermatozoa, which are also represented free. (§ 49.)

State of Medicine in Turkey.

An hospital for instruction has been recently opened in Constantinople in the medical school of Galataserai. It consists of a medical, surgical, and ophthalmic clinic, each of which contains fifty beds. It is distinguished by its cleanliness, comfort, elegance, abundant funds, and good management, in which it may be fairly ranked with any similar European establishment. Its chief officer is Dr. Bernard, who contributed greatly to its establishment; and the second officer is Dr. Hermann, inspector of the military hospitals. The medical school possesses everything which such an institution requires; an anatomical, mineralogical, zoological, and physical museum, a clinical laboratory, botanic garden, library, hospital, and a well-arranged dissecting-room in which the bodies, even of Mussulmen, are dissected. All that is wanted is a midwifery institution. The great jealousy of the Turks is an important obstacle to its establishment, but it is hoped that this may in time be overcome.

Allgemeine Medic. Central Zeitung. Juli 20, 1842.

Prevention of Syphilis and Cutaneous Diseases in the French Army.

A measure has been recently adopted for this purpose. Hitherto every venereal soldier on leaving the hospital was punished by a month's arrest of pay (*consigne*). The consequence was that the soldiers concealed the disease as long as possible, and resorted to quacks to be treated: bad cases therefore often occurred, and the cures were long and expensive. The punishment is now abolished for soldiers who voluntarily confess their disease on the appearance of the first symptoms of syphilis or itch; but they are still amenable to it if the appearance of primary symptoms has existed more than four days, and it is so distinct that they could not have mistaken it. Another new arrangement admits soldiers who have been absent on a week's leave or more, or who belong to the reserve, and are attacked by venereal diseases or the itch, to be treated at the expense of the state in the civil or military hospitals, provided they present themselves at the commencement of the affection.

Bulletin Générale de Thérapeutique. Juin, 1842.

Statistics of the Medical Profession in Norway.

In 1840 there were in Norway 128 civil and 58 military medical practitioners, of whom only 9 (military ones) had undergone no medical examination. In 1816 the number of practitioners was only 99; in 1824, 116; in 1833, 129; in 1837, 148; and in 1839, 159. The numbers of those who had been examined were in 1816, 71; in 1824, 86; in 1833, 95; in 1837, 128; in 1839, 149; and in 1840, 177. The number of practitioners has thus increased 88 per cent. in 24 years; and the number of those after examination, 149 per cent. Since the population of the kingdom in 1816 was 900,000, and in 1840, 1,250,000, it follows that in 1816 there was one physician to every 9000 persons, but in 1840 one to every 6800.

Norsk Magazin for Lægevidenskaben, Mars, 1841.

Compare a report " On the state of Medicine in Norway," in vol. IV, p. 541.

Music in the Morningside (Edinburgh) Lunatic Asylum.

On Tuesday evening Mr. Guynemer, one of Mr. Mainzer's professors, accompanied by several members of the Committee, and met by some of the Managers of the Asylum, held a *séance* in the new building. Dr. M'Kinnon, the excellent superintendent, who had made all the requisite preparations, and provided the music-books, assured the gentlemen, when they arrived, that his patients, above eighty well-dressed patients, nearly equally of each sex, were all delighted with the novelty, and were actually met in the chapel, anxiously expecting the welcome

strangers. One of the gentlemen addressed " *the meeting*," and in a friendly and familiar way introduced the subject and the professor, giving a brief history of Mr. Mainzer and his wonderful exertions and success, and stating the wish of the Committee that Morningside should have a share of what was making everybody in Edinburgh so happy. He was listened to with fixed attention, and applauded, according to established custom. At Mr. Guynemer's request, the audience gave a specimen of their Sunday psalmody by singing the hundredth psalm. This they did as well as most, and greatly better than many congregations. Every one present heartily joined. Encouraged by this trial, he proceeded to bring out the fundamental note *sol*, which, after an effort or two, was sung correctly by nearly the whole audience, and in a sensible business-like way, with none of that tittering which marks *sane* pupils. *La* and *si* followed, sung sometimes *forte*, sometimes *piano*, now by the ladies alone, then by the gentlemen, and now by both. Chords were achieved, the ladies singing one line and the gentlemen another in harmony, with this difference, when compared with *extra-mural* classes, that it was more readily, steadily, and *unerringly* done by the *intras*. The pupils were examined on the lines, spaces, and names of notes, and numerous voices called them out correctly; all were intent on their books, and had no difficulty in reading the right numbers of the short exercises, as well as, guided by the eye, singing the right notes. When three notes had been mastered, Mr. Guynemer, who conducted the lesson with uncommon tact and spirit, showed what three notes could be made to do, by singing a song of uncommon beauty (composed by Rousseau), and with his instrumental accompaniment, fine voice, and science, produced a manifest effect on the audience : who showed their capacity to distinguish really good music by expressing the pleasure they felt by murmurs of approbation while he sang, and a hearty round of applause when he concluded. The first lesson concluded with No. 15 of the well-known book, and a hymn of Mr. Mainzer's sung in parts, at sight, by several of the attendants, who volunteered, led and accompanied by Mr. Guynemer. The patients left the hall with the same decorum which they had preserved throughout ; there not having been, to our purposely-watchful eyes, a word, a look, or a movement, which could have led a stranger, unconscious of the place, to discover where he was

Practical conclusions rush into the mind from the experiment just described, too numerous and too weighty to be here indulged in. Every one may be expected to exclaim—what a commentary upon the enlightened view now taken of that merely physical ailment, that no longer mysteriously awful visitation, called insanity !—what a commentary upon that kindly, encouraging, " ministering to the mind diseased," which, so long ridiculed and dreaded, it is now a deep disgrace to any asylum not to follow ! We are struck with this proof of the possibility of concentrating a large assemblage of mental patients in one safely-exciting pursuit. During the sitting not one of them dreamed of his or her peculiar extravagancies ; *that* portion of the brain of each was quiescent, and the more and the longer quiescent, like fair play to a sore, the more likely and the more speedy will be the cure.

The friendly visit of Mr. Guynemer, and the " gentlemen," its respectful and evidently welcome reception, is also an instructive feature, strongly contrasted with the old abandonment of " the maniac," as he was called with a shudder, to chains and straw. There was not a patient present, probably, who did not feel that this was a recognition of his still belonging to society, and being the object of the sympathy and brotherly love of his fellow-men who are blessed with health of mind, and are actively and benevolently busied with the best means of restoring the same blessing to himself. Visits of strangers from mere curiosity are to be deprecated ; but visits such as this to a well-conducted asylum may have the very best effects on the inmates. Fears to mingle with the insane there might be in the irritation of the old coercive system ; there can be no such fears under the new. No stranger present, we are assured, would have hesitated to have sat down even unattended among these eighty pupils of Mr. Guynemer.—*Caledonian Mercury.*

BOOKS RECEIVED FOR REVIEW.

1. The Evolution of Light from the Living Subject. By Sir Henry March, Bart. M.D. M.R.I.A. &c.—Dublin, 1842. 8vo, pp. 59.

2. An Easy Introduction to Chemistry. By George Sparkes. — London, 1841. 12mo, pp. 88. 3s. 6d.

3. A Series of Anatomical Sketches. By Wormald and M'Whinnie. Part V.

4. A Brief Account of Facts in reply to statements in the Memoir of Dr. Hope. By C. J. B. Williams, M.D. F.R.S. &c.— London, 1842. 8vo, pp. 16. 6d.

5. Lecture on the Elementary Composition of Food, considered in reference to their nutritive qualities. By J. Pereira, M.D. F.R.S.—London, 1842. 8vo, pp. 34.

6. Cerebral Physiology and Materialism, with the result of the application of animal magnetism to the cerebral organs. By W. C. Engledew, M.D.—London, 1842. 8vo, pp. 30. 1s.

7. Guy's Hospital Reports, No. XV. Oct. 1842. 6s.

8. Clinical Midwifery ; with histories of 400 Cases of Difficult Labour. By R. Lee, M.D. F.R.S.—Lon. 1842. 12mo,pp.224. 4s. 6d.

9. On a variety of False Aneurism. By Robert Liston, F.R.S. — London, 1842. 8vo, pp. 39.

10. Observations regarding Medical Education, in a letter addressed to the President of the College of Surgeons. By John Simon, Demonstrator of Anatomy in King's College, London.—Lon. 1842. 8vo, pp. 33.

11. Food, and its influence on Health and Disease. By M. Truman, M.D.— London, 1842. 8vo, pp. 240. 7s. 6d.

12. Retrospect of the progress of Medicine and Surgery for the year 1841-2. By Mr. E. O. Spooner and Mr. W. Smart. Read before the Southern branch of the Provincial Medical Association.— Blandford, 1842. 8vo, pp. 87. 3s.

13. A system of Practical Surgery. By William Fergusson, F.R.S.E. Professor of Surgery in King's College.—London, 1842. 8vo,pp.596. 246illustrations byBagg.12s.6d.

14. An account of Askern and its mineral Springs. By Edwin Lankester, M.D. —London, 1842. 8vo, pp. 151. 4s. 6d.

15. On Injuries of the Head affecting the Brain. By G. J. Guthrie, F.R.S.—London, 1842. 4to, pp. 155. 6s.

16. Manual of Diseases of the Skin, from the French of MM. Cazenave and Schedel, with notes and additions. By Thomas Burgess, M.D.—London, 1842. 8vo, pp. 320. 7s.

17. Essays on Determination of Blood to the Head. By R. Hull, M.D.—London, 1842. 8vo, pp. 154. 5s.

18. A Treatise on the Principles and Practice of Homœopathy. By F. Black, M.D.—London, 1842. 8vo, pp. 239.

19. Turner's Chemistry. Seventh Edit. By Liebig and Gregory.—London, 1842. 8vo, pp. 1274. 28s.

20. Dr. Copland's Dictionary of Practical Medicine, Part viii.—Kidneys, Diseases of — Lungs, Diseases of.—1842. 4s. 6d.

21. Observations on the Admission of Medical Pupils to Bethlem Hospital. Third Edition, revised. By John Webster, M.D. —London, 1842. 8vo, pp. 62. 1s.

22. On the Preservation of the Health of Body and Mind. By Forbes Winslow, Surgeon.—Lond. 1842. 8vo, pp. 202. 7s.6d.

23. The Natural History of Man. By J. C. Prichard, M.D. F.R.S. M.R.I.A. &c. With numerous Engravings on wood and steel.—London, 1843. 8vo, pp. 556. 30s.

24. Practical Observations in Midwifery, with Cases and Illustrations. By John Ramsbotham, M.D. Second Edit. revised. —London, 1842. 8vo, pp. 501. 12s.

25. Chemistry of Animal Bodies. By Thomas Thomson, M.D. F.R.S. &c.—Lond. 1843. 8vo, pp. 702. 16s.

26. The Retrospective Address, delivered at the Tenth Anniversary Meeting of the Provincial Medical and Surgical Association, held at Exeter, Aug. 3d and 4th, 1842. By James Black, M.D. &c. — Worcester, 1842. 8vo, pp. 146.

27. Account of a Case of Successful Amputation of the Thigh during the Mesmeric State. By W. Topham, Esq. and W. S. Ward, Esq. M.R.C.S.—London, 1842. 8vo, pp. 26. 1s.

28. Medical Reflections on the Watercure. By J. Freeman, M.D. — London, 1842. 8vo, pp. 55. 1s. 6d.

29. The Great Physician, the Connexion of Diseases and Remedies with the Truths of Revelation. By John Gardner, Surgeon. —London, 1843. 8vo, pp. 359.

30. On the Chemical Discrimination of Vesical Calculi. By E. A. Scharling, Professor of Chemistry in the University of Copenhagen. Translated from the Latin, with an Appendix. By S. E. Hoskins, M.D. Plates.—Lond. 1842. 8vo, pp. 177. 7s. 6d.

31. A Practical Treatise on Pulmonary Consumption, its Pathology, Diagnosis, and Treatment, &c. By F. Cook, M.D. &c. —London, 1842. 8vo, pp. 120. 5s.

32. Recommendations for filling up the Register of Cases in Hospitals for the Insane.—Gloucester, 1842.

PART FIRST.

Analytical and Critical Reviews.

Art. I.

1. *The Effects of Arts, Trades, and Professions, and of Civic States and Habits of Living, on Health and Longevity, with suggestions for the removal of many of the agents which produce disease, and shorten the duration of life.* By C. Turner Thackrah, Esq.—*London*, 1832. 8vo, pp. 233.

2. *Report from the Committee on the Bill to regulate the Labour of Children in the Mills and Factories of the United Kingdom; with the Minutes of Evidence, Appendix, and Index. Ordered by the House of Commons to be printed*, 1832.

3. *The Philosophy of Manufactures : or an Exposition of the Scientific, Moral, and Commercial Economy of Great Britain.* By Andrew Ure, m.d. f.r.s.—*London*, 1835. 8vo, pp. 480.

4. *Report from the Select Committee on the Health of Towns ; together with the Minutes of Evidence taken before them, and an Appendix and Index. Ordered by the House of Commons to be printed*, 1840.

5. *Tableau de l'Etat Physique et Moral des Ouvriers employés dans les Manufactures de Coton, de Laine, et de Soie. Ouvrage entrepris par ordre de l'Académie des Sciences Morales et Politiques.* Par M. le Dr. Villermé.—*Paris*, 1840. Deux Vol. 8vo.
Sketch of the Physical and Moral Condition of the Workpeople employed in the Manufactures of Cotton, Wool, and Silk. A work undertaken by order of the Academy of Moral and Political Sciences. By Dr. Villermé.—*Paris*, 1840. Two Vols. 8vo, pp. 458, 451.

6. *Third Annual Report of the Registrar-General of Births, Deaths, and Marriages in England, with Appendices. Presented to both Houses of Parliament by Command of Her Majesty.*—*London*, 1841.

7. *Notes of a Tour in the Manufacturing Districts of Lancashire ; in a Series of Letters to His Grace the Archbishop of Dublin.* By W. Cooke Taylor, ll.d. &c. &c.—*London*, 1842. 12mo, pp. 299.

8. *Report to Her Majesty's principal Secretary of State for the Home Department, from the Poor Law Commissioners, on an Inquiry into the Sanatory Condition of the Labouring Population of Great Britain, with Appendices. Presented to both Houses of Parliament by Command of Her Majesty.* Drawn up by Edwin Chadwick, Esq.— *London*, 1842. 8vo, pp. 457.

We do not believe that we incur any very serious risk of being pronounced disciples of Jean Jacques Rousseau, if we concede that a high degree of civilization is not unattended by some prejudicial circumstances. These, however, seem to constitute not so much the necessary results of human advancement, as its accidental concomitants. It were paradoxical, truly, to maintain that an extension and enlargement of human capability should operate inevitably to the disadvantage of the race. And, indeed, we feel convinced that all the evils following in the train of advancing civilization are to be regarded, not as something inseparable from and inherent in such a state of things, but as the temporary result of that human imperfection which allows man to become enlightened, not in all things at once, but only progressively. The immense development of mechanical skill within the last half century, the great consequent extension of manufactures, and increase in the number, size, and density of our modern towns, furnish an excellent illustration of that puzzling combination of good and evil which leads some minds absolutely to condemn all human improvement in this direction, and to maintain the paradox that the condition of man is deteriorated by the progressive development of his natural powers. A sound wisdom, however, would apply itself to discover by careful analysis the real source of the attendant evil, and would see if its rectification could not be accomplished, without the necessity of acting upon so contradictory a doctrine as would seem to be involved in the position just referred to. The extent to which the evil in question bears upon the sanatory condition of the population forms certainly no unimportant part of any investigation undertaken with this object; and, accordingly, as falling within our peculiar department, we propose, in the following pages, to examine the facts which, in the present state of our knowledge, seem calculated to elucidate the question as to the effect of manufacturing industry upon health and longevity, and to determine, so far as may be within our power, what are the actual conclusions to which the evidence leads.

Like every other subject identified or intimately mixed up with human interests and feelings, this one has proved itself the fertile occasion of very contradictory statements and opinions. One class of inquirers, guided more, probably, by overwrought sentiments of humanity than by unbiassed judgment, have looked upon the discovery of the steam-engine and its application to the increase of our manufactures as little less than an unmitigated injury done to the bulk of society, accumulating the fruits of labour within the possession of a comparatively small number of capitalists, to the utter destruction of all health and comfort on the part of the actual producers of wealth; whilst, an opposite class, regarding the whole matter from another point of view, and more under the influence of a cool, calculating, and selfish political economy, have maintained that the extension of arts and manufactures in modern times has been an unalloyed benefit to the world, and one carrying with it the least possible

amount of disadvantage to the masses engaged therein, compatible with anything that is human.   Others again, estimating the subject less controlled by feeling, and more in the spirit of accurate and unprejudiced inquiry, have come to intermediate conclusions, believing that more or less of evil has resulted to great numbers, coincidently with very great advantages to mankind as a whole.   Much has been said and written, and adduced in evidence, intended to support every view of the case; and, in a subject of so extensive and multifarious and complex a character, any attempt to sift even the sanatory part of the question within the compass of a few brief pages, so as, even approximatively, to make out the positive facts and conclusions developed in the investigation, must prove, doubtless, both imperfect and unsatisfactory ; but, nevertheless, it is one of so practically important a character, in its relation to the well-being of society, that, in spite of its difficulty, we shall enter upon the task, cursorily reviewing the more important matter contained in the publications now before us, in order to see what is the precise information they afford, and how far the inferences deduced seem justified by the premises.

The late Mr. Thackrah, of Leeds, was one of the earliest English writers, systematically to direct the attention of our profession to the influence of employment upon health ; and his work cannot fail to be read by all with considerable advantage.   It furnishes sure signs of having been prepared with great care and of having been preceded by very attentive observation.   But the absence of figures, in the elucidation of the more important departments of the inquiry, diminishes greatly the value of the inferences and opinions.   However, there are comprised within the work many very sensible and judicious remarks, and we believe that in general they will be found to be tolerably correct.   Mr. Thackrah's experience was gained chiefly in the districts of the woollen manufacture ; and, as our present object is mainly to examine the influence upon health of manufacturing industry, we shall here present a brief digest of Mr. Thackrah's statements, occurring in various parts of the volume, relative to the condition of parties engaged in the woollen department.

We are told that, although many kinds of manufacturing occupation lead to the inhalation of dusty particles, the *sorters of wool*, who are occasionally annoyed with dust from the lime, which in some kinds of wool is used for separating the fleece from the skin, do not suffer on this account; and, what is yet more remarkable, that the *scourers*, who are all day in a wet room, exposed to steam and currents of cold air, are sensible of no ill effect; although, in washing the wool, the workpeople have their arms immersed up to the elbows in warm soap and water, and next carry the article into a room about the temperature of 80° Fahr. to dry, and immediately afterwards, often in a state of perspiration, and always without full clothing, turn out into the open air to fetch more wool.   Yet, it is stated that, from these great and frequent transitions, they are not more subject than others to rheumatism, catarrh, or pulmonary inflammation.   The *woolcombers* work in apartments heated to about 80° by charcoal fires : the wool, after washing, yields a light dust, which annoys the air-tubes, and obliges some persons to leave the employ, but yet the men whom Mr. Thackrah found engaged in the occupation, appeared quite healthy ; and it was said that out of a hundred individuals, only

two or three were absent from illness.   Three or four winters before the period of the author's investigations, typhoid fever had prevailed amongst the woolcombers; but this was attributed to the then low rate of wages, and consequent defect of nourishment.   The great heat of their working apartments, Mr. Thackrah did not regard as tending to shorten life, many men from sixty to seventy years of age having been noticed among the workpeople.   The sum, indeed, of Mr. Thackrah's statements, so far as they rest upon his own observation, would suggest that the woollen manufacture does not exert any special or undue influence in the production of disease or shortening of life; but, that the individuals whom it occupies are generally in good or in bad health, according to the rate of wages, which, when very low, bring into operations other and well-known causes of disease.   On the whole, he considers that the woollen cloth manufacture appears to be less injurious to health than any other, in which so great a number of operatives are collected together.   In discussing the influence upon health and life of the cotton manufacture, Mr. Thackrah draws a far less favorable picture.   However, as in this department his opportunities of arriving at a correct judgment were comparatively but limited, we shall avoid any examination of his statements in this particular, as some of the other publications before us furnish better materials for basing conclusions upon.

It will be within the knowledge of most of our readers that, at various times within the present century, the effect upon health and life of the cotton manufacture has attracted in this country a more than ordinary share of attention; attributable, in great part no doubt, to its recent most extraordinary rate of increase, and to the revolution it has wrought in modern times in the general condition of those parts of the country wherein it is extensively prevalent.   It was found that immense aggregations of individuals had, within a very few years, taken place in districts that had hitherto been almost rural; that the means of subsistence afforded to these dense masses of human beings flowed mainly from the existence of the factory system—a system, it was said, which led to the crowding together of all ages and sexes in heated apartments, leaving the individuals but little opportunity either for rest, fresh air, or healthful recreation.   This system was considered to operate with especial disaster to the young, sowing the seeds, where it did not speedily destroy, of future disease, in particular of scrofulous deformity and tubercular phthisis. These notions having powerfully excited the sympathy of many benevolent individuals, both within and without the legislature, this matter has at several times been made the subject of investigation both by parliamentary committees and special commissions; and a vast amount of information, bearing upon the whole question, has in consequence been obtained.   We have at present before us, in the shape of official and parliamentary reports, the substance of what has been obtained in the progress of this inquiry.   Some of the more important matter, in relation to our present object, we shall proceed to lay before the reader.

Before the parliamentary committee, obtained about ten years ago by the late Mr. Sadler, a great number of medical men and others were examined, with a view to ascertain the effects produced upon the human frame by the operation of the factory system.   The medical witnesses almost unanimously condemned and denounced it, as the abundant source

of pallid looks, stunted growth, personal deformity, and chronic disease
of various kinds.   One of the first medical witnesses examined, and one
having actual experience of the results of the factory system, was Dr.
Thomas Young, of Bolton, in Lancashire; this gentlemen, whose evi-
dence will be found at page 518 in the published report, was asked :

" Q. 'What are your opinions as to the medical effects produced by the hours
of labour, deduced as well from the principles of your profession as from your
actual observation ?'

" A. 'The first effects appear to be upon the digestion; the appetite suffers,
the digestion is impaired, and consequent emaciation and debility are induced.
Scrofulous diseases are common; I am not aware that this disease would be
produced in a sound child born of healthy parents, but if a predisposition to scro-
fula existed in the constitution, the disease (which might otherwise perhaps
have remained dormant in the system) is likely to be called into action.'

" Q. ' Have you observed whether pulmonary complaints are the frequent re-
sult of such labour ?'

" A. 'They are ; for example, consumption and asthma ; the latter, however,
I have more frequently observed in adults than in children.'

" Q. ' But so as clearly to be traceable, in your judgment, to the particular
nature of the employment to which reference is made ?'

" A. ' Certainly ; to the transition from excessive heat to cold, and the inha-
lation of dust and cotton flue.' "

The same witness, after dwelling at some length upon the tendency of
factory labour to induce scrofulous deformity, and disease generally,
stated that " he could not doubt that factory-working tended to shorten
life, inasmuch as it tended to produce disease."   These seem to have
been the deliberately-expressed convictions of an intelligent physician
residing in the heart of the cotton districts.   So that chronic disease,
chiefly of a scrofulous and tuberculous character, is here set forth as
having been aggravated and extended by the mode in which the cotton
manufacture has spread.

Most of the medical witnesses, however, who were examined before
Mr. Sadler's committee, were metropolitan practitioners, whose general
reputation suggested them to the committee, as suitable parties to give
information upon the physiological effects of certain kinds of occupation.
The working of the factory system, however, was, for the most part,
known to them only through the descriptions which were afforded; and
hence the value of their testimony suffers considerable diminution ; al-
though it is that which seems most to have influenced both the legislature
and public opinion.   There was yet one metropolitan witness, Mr.
Malyn, whose early days had been spent in the observation of disease in
Manchester, the capital of the cotton manufacture, and this gentleman
makes several remarkable statements.   The following is from his pub-
lished evidence occurring at p. 526 :

" Q. ' Can you say then, from observation and experience, if there is not a
great difference in the health and constitution of the operative classes of society,
which is induced by the difference of the length and kind of labour which they
have to undergo ?'

" A. ' As a practitioner, and as an observer of facts, I can affirm that there
exists a marked difference between the operatives of the metropolis and those
whose condition you are now investigating.   As a physiologist, and as such,
reasoning on those facts, I have been led to connect that difference with the
nature and duration of their employment.' "

In the progress of the examination, Mr. Malyn is asked if scrofula be not peculiarly prevalent in Manchester, and he replies that "it is to a great degree, nor have I, in the observations I have made elsewhere, ever seen it so common as it is in that town. Speaking from general recollection, I should say I have not witnessed, since my departure from that place, one tenth of what I observed there, although I have ever made it a rule (when otherwise unoccupied), to continue my researches among the poor." This is a startling statement; but we defer all critical remark, and proceed to the views expressed by other witnesses.

Dr. Blundell, whose evidence is published at p. 540 of the Report, is appealed to by the committee for his opinion as to the effects upon individuals, and especially children, to be looked for from prosecuting the kind of occupation described to him by the examinant as "the labour in question, continued for the length of time described, (thirteen, fourteen, fifteen, and even eighteen or nineteen hours a day,) without sufficient and often without any intervals, even for meals, generally pursued in an erect, or at least a constrained position, and in a foul and polluted atmosphere, frequently heated to a very high temperature, and many times continued far into or during the whole of the night." The effects anticipated by the witness are "dyspeptic symptoms, and all their consequences; nervous diseases in greater or less degree; and as the result of both, stunted growth; languors; lassitude; general debility; and a recourse to sensual stimulants in order to rid the mind of its distressing feelings." The examinant, in the progress of Dr. Blundell's evidence, states that "an official paper has been ordered by and delivered to this committee, which shows the great waste of human life, especially at its earliest stages, in the manufacturing or factory districts, as compared with the mortality at corresponding periods of life in other towns and places." We shall return to this assumed fact; and, happily, our national system of registration furnishes much more precise and accurate data, respecting all such subjects, than were to be found during any of the periods at which these parliamentary investigations took place.

In Dr. Hodgkin's examination, beginning at p. 546, a perpetual appeal is made to his anticipations as to the probable effects of the factory system, as represented to him by the querist; and the questions, in most cases, being proposed in the form denominated "leading," we have results expected, certainly of a most disastrous character. These are, great depression of the general health, diminutive stature, varicose ulceration of the lower extremities, scrofulous deformity, premature puberty in the female, leading to most immoral consequences; and the climax attained by the conclusion, that "where the system prevails extensively, considerable abridgement of human life must be the obvious consequence." Mr. Morgan, of Guy's Hospital, is subjected to an examination somewhat in the same strain, furnishing his answers apparently with equal satisfaction to the committee. One observation, however, made by this gentleman is too remarkable to be passed over without notice, and we shall here quote it, for the purpose of reverting to the same, when, in the succeeding pages, we offer our own remarks in the way of commentary. He says, "the employment of a chimney-sweeper I should consider, *perhaps*, more injurious than *even* these manufactories."

Amongst the medical witnesses furnishing their testimony before this

committee, the late Sir Anthony Carlisle occupies a prominent position. Although examined at considerable length, there is little in his evidence differing from or in addition to that afforded by the others whose testimony we have noticed. Some observations, however, made on the occasion by this witness, we shall here adduce, as containing, in our belief, rather questionable matter. In discussing the probable effects of the factory system much in the same strain as the foregoing witnesses, he avers, constructively, that, amongst other consequences, the procreative power diminishes considerably, as, in his opinion, it is one of the first faculties to cease with every diminution of animal health and vigour. He volunteers, also, a somewhat remarkable statement, in illustration and confirmation of the above position : " I would offer to the committee," says he, " a matter in my own experience ; the city of London would not maintain its population for fifty years, if it was not refreshed by accessions from the country. I have had the curiosity to see if I could find a person of the fourth generation, by both the father and mother's side in the city of London, and I have never been able to find such a person."

The statement on the part of an examining member of the committee, respecting the unusual rate of mortality in the districts where the cotton manufacture prevails, is repeated in yet stronger terms during the examination of the late Sir W. Blizard, to whom it is said, " Wherever this (the factory) system prevails, it is accompanied by an extraordinary degree of mortality, especially in the earlier periods of life ; taking the view you have done of the pernicious effects of labour so long pursued, and under the circumstances explained, you would be prepared for that result, namely, a greatly increased degree of mortality ?" To this, the witness replies : " I do not know the fact ; but, *à priori*, I should have no doubt of it, not the shadow of one." It is also the opinion of Sir William that, in the case of females, factory labour, as described, must lead to a premature attainment of puberty ; and in this view he is corroborated by other medical witnesses, and, as before stated, in very strong terms by Dr. Hodgkin.

It is demanded of Dr. Elliotson, by the committee, what he conceives would be likely to result from such a system of labour ; and to this he promptly replies, " scrofulous disease of every description, consumption, and deformities."

We cannot, in these extracts, from the report of Mr. Sadler's committee, omit to notice the very decisive character of Mr. Green's evidence, who, after stating that he cannot pretend to any practical experience in these matters, says, " I may yet be able to contribute some information that my professional duties have enabled me to acquire, in aid of your benevolent purpose of duly limiting the hours of infantile and early labour." Upon this, we have a most able and lucid exposition of the causes that excite and predispose to scrofulous disease, with the order in which its various forms are commonly developed, and the whole wound up with the following :—" And lastly, the lungs become the seat of this destructive disease in the form of that incurable complaint of our climate, pulmonary consumption." All this is placed in direct relation to the factory system by the mode in which the answers succeed the questions, and Mr. Green " fears that this country will have much to answer for, in permitting the growth of that system of employing children

in factories, which tends directly to the creation of all those circumstances which inevitably lead to disease."

The published evidence of Dr. J. R. Farre is too remarkable to be passed over without notice; one or two of its more striking passages, we here extract : "In English factories," says he, "everything which is valuable in manhood is sacrificed to an inferior advantage in childhood. You purchase your advantage at the price of infanticide; the profit thus gained is death to the child. Looking to its effects, I should suppose it was a system directly intended to diminish population." To the above strong expressions applied to the factory system, we subjoin the following observations having a more extended relation : "I call the British system a forcing system, which departs from the truth of nature, and from the revealed will of God. I have no hesitation in affirming that there is not a due regard to the preservation of life, either in the British system of education or of labour generally, both as regards the child and the adult; and what I say of the adult, applies still more strongly to the child."

The above quotations furnish the main substance of the testimony afforded by the medical witnesses upon the occasion referred to; and, assuredly, if the conclusions to which the whole points, have any material foundation in fact, it is difficult to say what national advantages ought not to be sacrificed, rather than that a system so destructive to humanity, both morally and physically speaking, should be allowed to go on without the application of some grave check. In reviewing, however, the whole of the circumstances connected with the evidence just adduced, it becomes clear that considerable one-sidedness is mixed up with the mode in which the testimony is obtained. The replies of the medical witnesses are almost invariably to leading questions; and, when they refer to factory labour in express terms, it is to the labour as described to them in the exaggerated phraseology of the examining members of the committee, who, but too often, in their way of conducting the investigation, remind one of the proceeding of the advocate in making out a case, rather than of that of the impartial inquirer after the truth. It is strikingly confirmatory of this view of the case, that, out of eighteen medical witnesses examined almost successively, sixteen were metropolitan, and two only from the manufacturing districts; and that one of these two, Mr. Thackrah, was a practitioner resident, not in the district of the cotton, but of the woollen manufacture. Indeed, in going through this evidence, we discover practically, little more than a series of judicious observations upon hygiène, accompanied with strictures upon the way in which its laws are presumed to be infringed by the proprietors of cotton mills.

We have said that considerable one-sidedness attaches to the character of the medical evidence, and that the severity and hardship of factory labour are described in obviously exaggerated phraseology; this would appear from an examination of some of the more important matter contained in the third work, the title of which we have placed at the commencement of this article. The Philosophy of Manufactures, by Dr. Ure, exhibits the results of great attention and labour in the investigation of the whole subject, and some of the author's statements are both curious and interesting, especially when compared with the direful details at which we have just glanced. Whatever undue bias may pervade the

work of Dr. Ure, and we think it far from being free from blemish of this kind, it yet possesses the great value of furnishing its facts and conclusions from observations actually made by the author upon the spot, he having, we believe, with a view to the investigation, resided for a considerable time in the very heart of the cotton manufacture.   We will contrast, then, Dr. Ure's account of the nature of factory labour, with that given by the members of Mr. Sadler's committee; and we shall afterwards compare the positive statements, as to the effects of the same upon health and life, with the anticipations which the descriptions of the parliamentary committee led metropolitan physicians and surgeons to form.

Now we ascertain, as the result of Dr. Ure's inquiries, made at a period of great manufacturing prosperity and activity, that, instead of the labour being pursued almost through the entire night, it is but rarely carried beyond twelve hours out of the twenty-four; and, that night-work is scouted by all respectable mill-owners, as being equally unprofitable and demoralizing.   We learn, moreover, that so far from the atmosphere being unusually polluted within factory walls, there exists in many cases a system of ventilation of very great superiority, as will appear from the following passage:

"The factory plan is to extract the foul air, in measurable volumes, by mechanical means of the simplest but most unfailing kind, especially by eccentric fans made to revolve with the rapidity of nearly 100 feet per second; and thereby to ensure a constant renewal of the atmosphere in any range of apartments however large or closely pent they may be." (p. 380.)

We quote further from the Philosophy of Manufactures, respecting the temperature of cotton-mills; it is observed,

"In Manchester, whenever the temperature of the external air is genial, no artificial heat is used in the fine spinning mills, which never require a heat above 75° Fahr., as several respectable witnesses prove on oath." (p. 400.)

And with respect to that "crowding together of individuals" in the apartments of cotton-mills, upon which so much stress has been laid, Dr. Ure says,

"It is utterly impossible, from the nature of the machinery.   The mules, in their advancing and retreating locomotion, must have five or six times the space to work in that the actual bulk of the mechanism requires.   Now, nine tenths of the children are employed tending these open-spaced mules.   Any one who has once visited a cotton-spinning room must be aware of the impossibility of unduly crowding human beings in a mule apartment.   Nor are any of the other rooms crowded with workers, for this plain reason, that no useful purpose could thence result to the manufacturer." (p. 401.)

We will now present to our readers some of the results relating to the health of factory operatives, to which Dr. Ure was led by his investigations.   On regarding the morbific effects attributed by large numbers to the prevalence of the factory system, diseases of the character and class ordinarily comprehended in the term "scrofula" seem to constitute the sum of the alleged consequences; thus, the vicious digestion, the nervous debility, and glandular disease; the stunted growth, osseous deformity, and pulmonary consumption; all these, as forming its special manifestations, were the results anticipated by medical reasoners; let us then see whether the testimony of medical observers deposes, with anything like uniformity, to the justness of such an inference.   Dr. Ure in-

troduces into his work a letter addressed to certain commissioners of inquiry by Dr. E. Carbutt, physician to the Manchester Royal Infirmary, which letter contains answers to certain queries that had been proposed to him, bearing directly upon this question ; portions of this letter we shall here extract :

"I wish to be permitted to make a few observations upon matters not contained in these queries, more especially as to the gross exaggerations of medical witnesses, particularly those of London, on the subject of the diseases of cotton factories. These gentlemen, hardly any of whom have ever had an opportunity of seeing persons employed in cotton factories, do almost universally attribute to factory labour the production of scrofulous diseases. Now the fact is, that scrofula is almost unknown in cotton factories, although the climate of this town and neighbourhood is particularly cold and humid. In a very extensive examination, which I and some other medical men made a few years ago, we found to our surprise, that the cotton factories, instead of producing scrofula, are, in some sort, a kind of means of cure. The late Mr. Gavin Hamilton, who was for thirty-six years, surgeon to our Infirmary, and who, previously to that, had been surgeon in the Queen's Bays, said in my hearing, after examining a cotton factory, ' Gad ! we found the factories to be a specific for the scrofula.' In one factory, examined by Dr. Holme, and Mr. Scott, surgeon to the Carbineers, of 401 persons employed, eight persons only were affected with scrofula, with no case of distortion of the spine or limbs. . . . . This remarkable absence of scrofula I presume, with perfect deference to the medical gentleman who is one of your number, to attribute to the dryness and warmth of the cotton factories, to the lightness of the work, and to the superior food and clothing which the superior wages of the workpeople enable them to obtain.

"In addition to the above facts, I may mention that, during the sixteen years I have had the honour of being physician to the Manchester Royal Infirmary, I have, nearly invariably, at the consultations previously to operation, to which the physicians are summoned as well as the surgeons, been in the habit of putting to the patient the question, ' what trade are you of ?' especially when the case was that of a distorted limb or joint. To which question the answer has almost never been 'work in a cotton factory,' but almost constantly, ' a hand-loom weaver,' or ' a hatter,' or some other trade.'' (p. 376.)

The statements contained in the above communication possess, certainly, very great interest. Coming as they do from a practical physician, resident in the metropolis of the factory district, with the best opportunities for arriving at a knowledge of the actual facts of the case, they cannot but carry with them considerable weight and importance. However, we proceed to notice the further evidence adduced by Dr. Ure, in support of his views regarding the influence of cotton mills on health. The subjoined statement is remarkable, but Dr. Ure does not mention the authority upon which it is made:

"During the prevalence of the cholera at Stockport, it was observed that the mill-workers enjoyed a remarkable immunity from the attack ; an immunity due to the warm dry air which surrounded them while at work, and to the comforts of their homes. The cholera patients in that town were almost all females employed in private dwellings." (p. 378.)

The following fact, if literally true, constitutes a very singular circumstance :

"Not one of Messrs. Strutt's work-people at Belper was attacked with cholera, while the neighbouring handicraft people and farmers were falling victims to this pestilence." (p. 378.)

There is contained in the work whose contents we are now examining,

a very valuable and interesting communication upon our present subject from Mr. Harrison, the inspecting surgeon, appointed for the mills of Preston and its vicinity, in an official report, made some years ago by that gentleman, within the limits of whose jurisdiction it seems that there were 1656 individuals employed in mills under eighteen years of age, of whom 952 were engaged in spinning-rooms, 468 in carding-rooms, 128 at power-looms, and 108 in winding, skewering, cops, &c. Mr. Harrison reports as under:

" I have made very particular inquiries respecting the health of every child whom I have examined, and I find that the average annual sickness of each child is not more than four days; at least, that not more than four days on an average are lost by each child in a year in consequence of sickness. This includes disorders of every kind, for the most part induced by causes wholly unconnected with factory labour. I have been not a little surprised to find so little sickness which can fairly be attributed to mill-work. I have met with very few children who have suffered from injuries occasioned by machinery: and the protection, especially in new factories, is now so complete that accidents will, I doubt not, speedily become rare. I have not met with a single instance out of the 1656 children whom I have examined, of deformity that is referable to factory labour. It must be admitted, that factory children do not present the same blooming robust appearance, as is witnessed among children who labour in the open air, but I question if they are not more exempt from acute diseases, and do not, on the whole, suffer less sickness than those who are regarded as having more healthy employments. The average age at which the children of this district enter the factories is ten years and two months; and the average age of all the young persons together is fourteen years." (p. 379.)

Before closing with Dr. Ure's work, we shall avail ourselves of certain passages, which it contains, taken from Sir David Barry's Factory Commission Report. The following bears strongly upon our present subject:

" There is one thing I feel convinced of from observation that young persons, especially females, who have begun mill-work at from ten to twelve, independently of their becoming much more expert artists, preserve their health better, and possess sounder feet and legs at twenty-five, than those who have commenced from thirteen to sixteen and upwards." (p. 389.)

Further, in noticing the question relative to the growth and development of persons engaged in factory employment, Sir David gives the following as the result of personal inspection:

" Many of the girls were beautifully formed, who had been from ten years of age to maturity in the mill. I noticed five sisters, from thirteen upwards, all employed in the mill from their childhood, every one of whom might be termed a fine-grown girl; some of them remarkable for symmetry and strength. This day I examined carefully and individually 111 girls of the classes stated, with a view to find, if possible, a case in which the plantar arch, (the hollow of the sole,) had been broken down by continual standing, as is stated in the evidence lately printed, (Mr. Sadler's Committee,) to occur sometimes in factory workers. I found many beautifully-formed feet in those who had worked the longest. In no case did the plantar arch seem to have been in the slightest degree disturbed. Nothing but the evidence of my own senses could have induced me to believe that girls, indeed any human beings, worked as stated from nine years upwards, could yet possess in maturity the apparent extreme of high health and vigour, with finely-proportioned forms. It is quite impossible to give an adequate notion of the quickness and dexterity with which two girls about thirteen years of age, joined their broken ends of threads, shifted the pirns, screwed and unscrewed the flies, &c. To supply the place of such artists by new hands would be utterly impracticable, and difficult in the extreme to find a relay of hands equally ex-

pert under present circumstances. There is no sameness of attitude, no standing still ; every muscle is in action, and that in quick succession." (p. 391.)

We shall here finish our extracts from the work of Dr. Ure, in which he attempts to show that factory labour is not only not conducive to the production of scrofulous diseases, and to the deterioration of the general health, but actually protective against such calamitous results to those who are engaged in it. We may state, however, that he adduces in further support of his views a variety of testimony in addition to that which we have specifically noticed, and that too from persons whose opportunities must have made them practically acquainted with the subject. And, truly, when all this is placed in juxta-position with the evidence which we have also noticed of a totally opposite character, it furnishes materials for a judgment little complimentary either to medical reasoning or medical observation. On the one hand, we have the deepest sympathies of our nature excited, in commiseration of the unfortunate condition of the victims of manufacturing avarice ; and, on the other, we are gladdened to the heart that modern advances in civilization, with their mechanical improvements and increased means of production, have, whilst enriching the capitalist, trebled and quadrupled the health and the happiness, and the bodily comforts of the most helpless of our fellow-creatures ! What must we conclude amidst such conflicting testimony ? We shall postpone the attempt to determine, whilst we further investigate the data upon which to found a reasonable judgment.

The celebrated French statistician, Dr. Villermé, has, within a recent period, applied himself to the examination of the moral and physical conditions of the workpeople, employed in the manufacture of cotton, of wool, and of silk ; and the result he has exhibited in the work whose title is prefixed, undertaken by order of the Parisian Academy of Moral and Political Science. Before examining the contents of Dr. Villermé's volumes in so far as they bear upon our present disquisition, we shall submit to our readers portions of the author's preface, which will explain the way in which the inquiry arose, and, at the same time, furnish a kind of guarantee for the accuracy of his observations, as showing the scrupulous exactness with which he seems to have prosecuted his labours :

" The Academy of Moral and Political Sciences, commissioned M. Benoiston de Chateauneuf and myself to make, in the departments of France, certain researches in political economy and statistical science, the object of which was to *ascertain, as exactly as possible, the physical and moral condition of the working classes*. . . . . For the purpose of rendering our mission more useful, M. Benoiston de Chateauneuf and myself separated. Whilst my associate traversed the centre of France, and the sea coasts, I visited the departments where the cotton, woollen, and silk manufactures chiefly occupy the workpeople. I shall premise, however, by stating the mode in which I proceeded in my researches. It was necessary for me to examine the effects of a work upon those whom it employs, to interrogate misery without humiliating it, and to observe misconduct without irritating it. This task was difficult. Well ! I love to say it, every-where magistrates, physicians, manufacturers, mere workmen were anxious to second me. By their aid, I have been enabled to see, to hear, and to become acquainted with everything. They have furnished me with information, as if in emulation of one another. Some I got by direct inquiry, some I obtained unawares. And such is the care which I was anxious to apply to this investigation that I have followed the workman from his workshop to his dwelling. I have entered there with him, I have studied him in the bosom of his family ; I

have assisted at his meals. I have done more; I had seen him in his toils and in his household, I have wished to see him in his pleasures, to observe him in his parties. There, listening to his conversation, occasionally mingling therein, I have been, unconsciously to himself, the confidant of his joys and his sorrows, of his regrets and his hopes, the witness of his vices and his virtues." (Pref. vi.)

Such is the spirit with which Dr. Villermé set out in the investigation; and, after the protestation of so philosophical a procedure, on the part of our author, a very high interest and importance must attach to any testimony bearing upon the subject, which emanates from such a source. We shall examine, then, the results of Villermé's experience, relating to the effects of manufactures upon health, as exhibited in France; and, as the space devoted to the sanatory part of the inquiry occupies but a small proportion of one of the volumes, we shall endeavour to comprise the substance of what the work sets forth, upon this matter, in a very brief compass.

M. Villermé commences by asserting that he had heard much in the course of his researches, relative to the insalubrity of manufactures, especially of the cotton manufacture. He first notices the charge of insufficient ventilation as a cause of disease, and then proceeds to give the result of his own investigations upon this point. After furnishing an account of the precise measures of the various work-rooms, with the mode in which the air is renewed, and the number of individuals which they inclose when in full operation; he concludes that the great bulk of those employed in the cotton mills have a better supply of air at their work than at their homes, and better also than great numbers of other classes of workpeople. In the cotton manufactures, however, there is, he says, one class of workpeople worse situated in a sanatory point of view than the rest; he alludes to the *batters of cotton*, whose occupation necessitates the inhalation of much dust and *flue;* this class he states to include very small numbers, and to be found only in the mills for fine-spinning, a department of factory labour usually considered to be the least healthy, and respecting the morbific influence of which we shall refer to some important statistical documents in the sequel. M. Villermé states that he discovered an entire accordance of opinion respecting the injurious influence of the dusty inhalation, on the part alike of workpeople, of overlookers, and managers, of the masters themselves, and also of medical men. Indeed, he states that the unhealthful influence of *cotton-batting*, whether done by machinery or by the hand, is so generally admitted, that workpeople engaged therein, relieve one another like soldiers called to mount guard. He says, that, whether it be the dust contained in the raw cotton apart from the cotton flue, or this latter itself, which ruins the health of those engaged in the process, the decay of their health is ever certain, and an established fact; that they complain of dryness in the mouth, in the throat, and are seized sooner or later with a cough gradually increasing in severity. " Nevertheless," he says, " I have met in the batting-rooms some men in good health who told me that they had worked there uninterruptedly for many years." The cough is the first symptom of a slow and formidable disease of the chest, which is always relieved on abandoning the work, and altogether cured at its commencement, if the employment be not resumed. The disease, in the progress of its development, assumes all the characteristics of phthisis, and the

medical men resident in the manufacturing districts call it 'cotton-phthisis,' (phthisie cotonnense,) and some ' cotton-pneumonia.' M. Villermé states that numbers from this cause die in the hospitals, but that he could not ascertain in what proportion. Formerly, cotton-batting was invariably attended with all these inconveniences, but recent improvements in machinery, the author states, have remedied them in great measure ; and the number subject to this hurtful agency has now become exceedingly limited. The carding of cotton which leads to some extent, to an inhalation of a dusty atmosphere, is attended, he observes, with a like insalubrity, though to a much less extent. In all the subsequent processes, however, no inconvenience of this kind results.

Our author considers himself in a condition to refute the accusations of unhealthfulness often made against cotton mills on the score of the employment of oils, and certain other greasy materials, which cause disagreeable odours, and thence are considered to operate prejudicially upon those who are subjected to them.

" But, see these people," he says, " interrogate them, interrogate the medical men and other persons who observe the workpeople, and you will very soon be convinced that these things never inconvenience them ; that, for the most part indeed, they do not perceive what is so obvious to the senses of strangers ; they would, on the contrary, be much more likely to remark their absence if by any chance they should cease all at once. Singular mistakes have arisen in attributing to such causes, diseases induced by protracted labour, want of rest, insufficiency of food and its bad quality, habits of improvidence, drunkenness, and, to say all in one word, wages below the actual wants of the recipients." (II. 208.)

M. Villermé notices in detail the supposed effects upon the health, of the elevated temperature required in certain factory processes. For carding, he says that a heat of from 59° to 61° Fahr. is all that is required ; for spinning, however, a higher temperature is needed, a temperature rising in proportion to the fineness of the threads in course of fabrication, and varying accordingly from 64° to 104° Fahr. ; the extreme degree, however, is only needed in comparatively few instances ; and we believe it to exceed what is ever required in our own mills. It seems that, according to the inquiries made, the results of the excessive heat could not be uniformly ascertained, as sometimes he was told that no other unpleasantness followed than a sort of erysipelatous inflammation about the bend of the thigh, especially in the case of fat persons, and that this necessitated them occasionally to relinquish their work for a short time only ; others stated that many workpeople were in consequence obliged to abandon the fine-spinning work altogether ; and again it was said that none but the young could endure the high temperature. M. Villermé was informed also, by many medical men, that an unusual quantity of those so employed were attacked with colds and severe inflammation of the chest, as a consequence of the sudden chilling to which they were exposed. In other instances, however, where the excessive heat is not needed, the work-rooms maintain, especially during winter, a much more gentle and agreeable temperature than the operatives enjoy at home. The influence of the monotony and tediousness of factory labour in the production of pale looks, and general languor of the whole system, is slightly glanced at.

The woollen manufacture, in the estimation of our author, is less pre-

judicial to health than that of cotton, inasmuch as the special causes of insalubrity have less intensity in the one than the other. Thus the batting of wool occasions much less dust than in the case of cotton, so little indeed that the workpeople scarcely feel any inconvenience. Further, the spinning of wool requires only a moderate temperature; and, with few exceptions, the other processes employed in this manufacture require no insalubrious or even unpleasant degree of heat. Good ventilation is obtained in the woollen apartments equally with those of the cotton manufacture. He sums up his observations upon the sanatory condition of this class of operatives, by stating that neither carders, nor spinners, nor combers, nor winders, &c., appeared more subject than others to particular diseases, from the mere fact of their occupation. Any maladies to which they were unusually liable, seemed to arise rather from circumstances common to all persons engaged in any sedentary pursuit, and passing but little time in the open air.

The manufacture of silk has been stated to be especially unhealthy only in the operations of carding the raw silk, and of drawing the cocoons, (tirage des cocons;) but M. Villermé avers that this is not the case to the extent that has been maintained. He considers that much of the ill health experienced by this class of persons depends upon their bad clothing and want of cleanliness. He mentions that the *drawing* process does not ordinarily continue beyond three months in the year; and hence it cannot have that deleterious influence which it might probably exercise if prolonged throughout the year. The operations of batting and carding the raw silk, as observed by himself at Nimes and Montpellier, did not raise dust to that abundant and prejudicial extent which his reading had led him to expect. Ventilation in the silk-rooms does not seem to be so complete or so well managed, as in those of the cotton or the woollen manufactures; and, on this account, many diseases of the respiratory organs are occasioned by the confined spaces and want of renewal of the air, circumstances which overheat the apartments, and constrain the respiration. Some workpeople thus engaged, however, were observed to be in a state of robust health; but M. Villermé was informed, that this was, in some respects, attributable to the fact of a speedy removal to the hospital following any notable derangement of the health. Altogether, both from his own observation, and from the statements he obtained, he concluded that the early processes (and those only) of the silk manufacture were decidedly unhealthy; but of the precise character of the diseases induced, we are not informed; we infer, however, that the ill effects were witnessed in the production of a bad state of the general health, rather than of special affections.

Our author presents us with a brief section upon the health of the hand-loom weavers, the wretchedness of whose occupation is a matter generally known, and universally admitted; especially in the case of those engaged in the weaving of the cotton fabric. Damp cellar-residences, with small but crowded apartments, miserable ventilation, with imperfect supply of solar light,—a state of things falling to the lot of most persons engaged in this work, cannot be otherwise than hurtful in the extreme to their sanatory condition. Indeed, this class of people may almost be regarded as placed at the zero mark of the social scale; and, as a consequence, it may be expected that they are rendered liable to

every possible disease to which an utter neglect and violation of the laws
of hygiène subjects both the species and the individual.

In offering certain general considerations arising from the foregoing,
M. Villermé observes, that no diseases appertain exclusively to manu-
facturing pursuits; but there are some, he says, which occur more fre-
quently to the workpeople engaged therein, when the conditions in which
they live favour their development.   It is thus, he goes on, that in the
cotton manufacture, cough, inflammation of the lungs, and pulmonary
consumption attack great numbers of those who are occupied in the
carding and batting of cotton; and, further, that, according to the indi-
cations noted by himself, these afflicting diseases make considerable
ravages among the piecers, the sweepers, and the cleansers, a result at-
tributable to the inhalation of dust and cotton-flue. Numerous, however,
as are the victims of phthisis and pneumonia, he yet regards their pre-
mature decease as an evil less deplorable than the extensive prevalence
of scrofulous affections among the body of operatives engaged in manu-
factures.   It is a matter of notoriety, how this scourge, in all its hideous
varieties, afflicts the inhabitants of great towns, especially the poor, ac-
cumulated in narrow streets, in filthy, dark, and ill-ventilated lodging-
houses, places but rarely permeated by the solar ray. But manufactures,
even in their actual organization, must not be blamed exclusively for this
state of things; the evil is not peculiar to them; it was assuredly not less
frequent formerly in proportion to the existence of other insalubrious con-
ditions, when the present manufacturing system had not sprung into
existence.   M. Villermé says that it is chiefly in a mediate, in an in-
direct manner, that most of these evils arise.   The kind of food, the
clothing and lodging, the degree of fatigue, the continuance of the hours
of labour, and the moral conduct of individuals, are the main circum-
stances which influence the health prejudicially or otherwise; and with
a beneficial character of these conditions, many of the accidental causes
of disease would lose their efficacy.

The above comprises the summary of M. Villermé's views and ex-
perience, relative to our present subject; and, having a fair amount of
data now before us, we shall offer some comment upon the whole, a task
for which, we may be allowed to add, a residence and practice of some
years amidst manufactures may, in some measure, have qualified us.
And, in the first place, we must express our conviction that, in this country
at least, the question now before us has, in the various efforts for its
elucidation, never been thoroughly divested of extraneous considerations.
When the influence of manufactures upon health and life has, at any
time, been made the subject of inquiry, it has rarely been discussed and
investigated *by itself*; matters bearing upon their general social effects,
and questions of political economy, have been so intermingled therewith,
that, almost unavoidably, the spirit of party has obscured, in most cases,
the perceptions of the investigator, and confused and complicated the
entire subject.   In what other way can we account for the wonderfully
diverse character of the results variously obtained? results too, not af-
fecting a hidden or remote department of research, nor yet obtained
under circumstances allowing with difficulty the customary aids to de-
termine the precise complexion of the related facts; no, but results that
concern the best interests of large masses of the community, whose actual

condition, upon which the question arises, is observable by all who are anxious for information upon the subject.   Whenever such contradictory evidence as to pure matter of fact is accumulated, it is a sure sign that the question is more or less beset by prejudice, and involved in the spirit of party.   Let the testimony reviewed in the foregoing pages, presented to Mr. Sadler's committee, be again considered.   Do we not find an un-doubted perversion of fact pervading the whole, with a subtle commit-ment of eminent medical authorities to the side obviously espoused by the leading members of that committee ?   How, otherwise, can we ex-plain the almost universal consent of medical men of undoubted judgment and information, in condemning the manufacturing industry of this country, not as a system complicated with accidental circumstances prejudicial to a sound condition of the human fabric, which the improve-ments that ever follow upon an advancing civilization may be expected progressively to remove, but as one necessarily tending to produce dis-ease, to shorten life, and to destroy population ?   How, otherwise, than by attributing the circumstance to some gross perversion of fact, could the interior of a cotton mill have been at all compared with that of a chimney choked with soot, as was virtually done by Mr. Morgan in the notable remark before quoted, that " perhaps the employment of a sweep was even worse than these manufactories."   No wonder that Dr. Cooke Taylor, as stated at p. 22 of his recently-published Tour, should have been led by this parliamentary evidence to believe that " mills were places in which young children were, by some inexplicable process, ground—bones, flesh, and blood together—into yarns and printed calicoes."

We do not ourselves approach this subject in the spirit which we here condemn ; we have no conceivable interest in the question, direct or in-direct, beyond what is inspired by a regard for justice, and an anxiety to separate the true from the false ; and, accordingly, we shall proceed in this discussion, in the spirit, we trust, alike of candour and impartiality.

We have said that medical testimony, in sweeping condemnation of the factory system, was obtained by Mr. Sadler's committee, through a per-version of the facts of the case ; let us examine this matter a little more closely.   We have before quoted the committee's description of factory labour ; and, will it, after all the evidence adduced in the foregoing pages, be regarded as faithful ?   We are able to confirm Dr. Ure's accuracy, when he states that this labour is not, as maintained, "often continued through the night with scarcely any intervals for recreation or meals."   If the statement have had any foundation in fact, it must have been in some ex-ceptional instance, under special circumstances. The operatives, as a rule, are engaged, when in full employment—much too long we admit—from six in the morning until seven or eight in the evening, with half-hours' pauses in the mill for breakfast and tea, and an hour for dinner at home, from twelve to one ; and this we believe to be now almost universal throughout the districts of the cotton manufacture.   This is a state of things far from satisfactory as to hygiènic conditions, for the young more especially ; as it allows, certainly, insufficient periods of repose, in which healthful digestion can take place, and out-door exercise be enjoyed. But surely the presence of this evil to some extent does not justify extra-vagant exaggeration.   The occupation is not, as averred, necessarily pur-sued in any unusually " constrained position ;" that it is for the most

part tedious and monotonous is certain, but this supplies no data for its especial condemnation. Let factory labour, in these respects, be compared with many other employments, with those of the tailor, of the dressmaker, &c. &c., and, certainly, it will not suffer by the comparison. But the " air is foul and polluted :" let our extracts from Dr. Ure's work as to the state of things in Lancashire, and those from M. Villermé as to France, testify to the contrary. Cotton mills, usually, are well ventilated. Dr. Cooke Taylor, in the work to which we have just referred, says at p. 23, " I should be very well contented to have as large a proportion of room and air in my own study as a cotton spinner in any of the mills of Lancashire."

We are by no means the apologists of the factory system as it stands; we do not coincide with Dr. Ure in his excessive eulogies of this labour, as contrasted with rural pursuits, and, assuredly, we do not believe it, with some, to be curative of, or protective from, scrofulous disease. We think that partisanship has biassed inquirers at the two extremes of the question. The faults of exaggeration and partiality in the selection of illustrations lie grievously at Dr. Ure's door; and, more recently, Dr. Taylor, we think, has betrayed somewhat too much of the convert's zeal in his praises of cotton mills and cotton lords. Having, from errors in the other direction, been, in his own phraseology, first led to regard the former as places where human " bones, flesh, and blood together were ground into yarn and printed calicoes ;" and the latter " as the living representatives of the ogres and giants of our nursery tales ;" it is no wonder that, when enjoying the hospitality of such men as Mr. Henry Ashworth, of Turton, near Bolton, and inspecting the admirable economy of the mills and cottages belonging to that gentleman, the ordinary consequences of revulsion of feeling should arise, and that mills and their vicinity should, in the warmth of a kind Irish heart and an excited imagination, become as Eden, and the owners thereof as so many guardian angels. There is, however, in spite of certain drawbacks in Dr. Taylor's work, much valuable matter, exhibiting the folly of the monstrous portraitures of factory labour drawn some years ago, the effects of which upon public opinion are yet far from being extinguished.

Whilst we maintain that many of the conditions of health are as little violated by manufacturing industry as by the immense proportion of other pursuits, we still believe that factory labour is on many accounts injurious; that is to say, when contrasted with the state of the classes raised above that of the operative. How, indeed, can it be otherwise, when regarded as a whole? Individuals thus employed do not spend in the open air more, on an average, than an hour or an hour and a half, in the twenty-four; work is resumed almost the moment the meals are consumed, allowing but little rest for the initiation of a sound digestion; and, in the case of the young, there is nearly an entire absence of that delightful " child's-play," which the purest feelings of our nature reveal to us as so essential to juvenile health, vivacity, and vigour. Causes like these must and do depress, more or less, the vital energy, and induce, certainly, a lower state of the general health than would exist with the presence of an opposite state of things. But, in all this, we have nothing peculiar to the factory system. With the great majority of the working classes in large towns these causes have a general operation.

There are the foundries, where machinery is constructed ; there are the joiners' shops, the dye-works, the hat manufactories, the tailors' and milliners' work-rooms ; there are the letter-press-printers' apartments, the compact counting-houses ; indeed, with few exceptions, the conditions of every kind of labour, in any of our modern cities, present almost the same exceptional points as those of our manufactories, some being more or less favoured in particular respects.

But, it may be demanded, do we believe that no evils occur, specially, to health and life, from the way in which our manufactures are conducted ? We frankly confess that the result of all we have read, and all we have seen, has been to convince us, that diseases, peculiarly attributable to manufactures, are not to be found amongst the population dependent upon them. And yet the opposite opinion prevails extensively, and has received countenance and support from the express statements of many who have made this subject a matter of investigation. We cannot help thinking, however, that preconceived notions have biassed the judgment in these cases, when conclusions have had to be drawn from the facts observed. We think that a certain effect has been declared, because, reasoning from analogy, it seemed fairly to be expected. A state of things, calculated to affect a novice in a certain way, does not necessarily produce a similar effect upon the experienced ; this wonderfully accommodating principle in the animal economy is too often overlooked ; and, hence, it is remarkable how little accordant with the anticipation is the actual condition of many classes of workpeople. Thus M. Villermé informs us, that he had read a great deal of the insalubrious influence of the woollen manufacture ; yet his observations furnished no corroboration of the alleged fact. We have all, in our minds, associated the inhalation of minute dusty particles with the development of protracted bronchial irritation ; and yet, according to a foregoing extract from Mr. Thackrah's work, the sorters of wool, who are thus annoyed, do not suffer in their health on this account. Exposure to damp and currents of air, with sudden transitions from heat to cold, we ever regard as direct causes of pulmonary inflammation and rheumatic affections ; and such would undoubtedly be the result to parties unaccustomed to such exposure ; but habit, in such instances, exerts a vast preservative influence. Thus, we are told by Mr. Thackrah that wool-scourers, so situated in an eminent degree, are not more subject than others to such affections. There is no question whatever that this law of accommodation operates only within certain limits ; but still there is such a law, and the extent of its influence should be fairly watched and estimated in all such inquiries as the present.

We conceive, for our part, that the great mass of disease constantly witnessed in the districts where manufactures prevail, and so often laid to their account, flows rather from the *great-town* than the *factory-system.* As we said at the commencement of this article, we concede that a high degree of civilization is not unattended with some prejudicial circumstances ; and, among the most prominent of these, we regard the rapid springing into existence of our modern towns, which, being the result chiefly of commercial enterprise, arrange themselves for the most part with but little regard to the conditions of health. The attention of the government is now being fast drawn to the consideration of this question ;

the results of some parliamentary investigations are now before us; let us slightly glance only at some of these evils, and we shall see causes in operation for the production of disease in towns, far more potent than any that originate essentially with manufacturing industry. Thus, in the Report made by a committee of the House of Commons upon this matter, some two or three years ago, we find the following amongst other passages, illustrating the special causes prejudicial to health, in the actual state of our large towns:

" Evidence of undoubted credit, and of the most melancholy description, has been laid before your committee, showing the neglected and imperfect state of the sewerage, paving, and cleansing in many parts of London inhabited chiefly by the working classes; and similar evidence applies with more or less force to many other great towns, the state of which has been investigated, as Dublin, Glasgow, Liverpool, Manchester, Leeds, Bradford," &c. (p. vi.)

The committee dwell at some length upon the dense crowding of cellar and other imperfectly-ventilated residences, as the abundant source of disease in all its varieties, the ill consequences of which are further aggravated by the causes enumerated in the extract we have just given, occasioning damp, the accumulation of filth, and other well-known sources of disease. It is impossible that causes of this kind can be in constant operation, without a terrible deterioration of the health on the part of those who are subjected to such noxious influence; and, we feel well convinced that here will be found the effective agents in the production of disease amongst persons engaged in manufactures. The following passage from the parliamentary Report is of some importance as bearing upon this inquiry:

" In Manchester, the capital as it may be called of the cotton trade, with a population of not less than 240,000, nearly 15,000 of the poorer inhabitants constantly inhabit cellars. Though *the habitations of the working classes are described as better than those of Liverpool*, the want of proper building regulations, and any effectual sewerage and cleansing, as applicable to the localities inhabited by the workmen, is most justly complained of." (p. x.)

Manchester and Liverpool form admirable instances for comparison, in regard to our present purpose; they have a somewhat corresponding amount of population, and the towns occupy very nearly the same superficial extent; the one has been created and lives by the factory system, the other contains, we believe, but one factory, and that of very recent construction; yet the returns of the registrar-general exhibit a higher rate of mortality, and a presumably greater prevalence of disease in Liverpool than in Manchester; and the passage in the above quotation, which we have rendered in italics, indicates a greater abundance of the ills of the great-town system.

In speaking of the condition of factory operatives, we have stated our belief that, on several accounts, their position was unfavorable to health and longevity; but that, in this regard, they differed but little, if at all, from other classes of workpeople who were exposed to the same injurious influences, excepting those supposed to flow especially from the factory system. Mr. Chadwick, the secretary to the Poor Law Commission, in the Sanatory Report, noticed at some length in the present Number of this Journal, has collected certain statistical tables which show that the value of life is greater in the rural than in the town districts; and that,

on the average, professional persons and gentry, with their families, attain a higher age than do tradesmen and farmers with their families; and that these latter again have better chances of life than the working classes. Now these facts are most valuable as showing the source of many fallacies that have arisen in the discussion of such questions as our present one; they show that a high mortality may prevail in a particular locality, not because it is the seat of some special department of industry, but because its working population, irrespective of the particular employment, may unduly preponderate. They show that, as a rule, the lower the position of any individual in life, the less favorably situated may he be presumed to be in relation to the conditions of true health; and, upon detailed examination, they show that as the peculiar evils of the "great-town" system abound, the value of life diminishes accordingly; and, assuredly, Mr. Chadwick's figures do not make an unduly unfavorable exhibition of the towns where manufactures prevail, when contrasted with non-manufacturing towns similarly conditioned in all other respects.

The tables in question were obtained from careful analyses of the registration books, by the clerks of the several poor law unions, who at the same time act as superintendant registrars. We shall select a few examples, in illustration of what we have set forth; thus, in the returns of the average age of death amongst the different classes of people in manufacturing Manchester and agricultural Rutlandshire, the figures stand so:

	Manchester.				*Rutlandshire.*
Professional persons and gentry, and their families	38	.	.	.	52
Tradesmen and their families (in Rutlandshire, farmers and graziers, are included with shopkeepers)	20	.	.	.	41
Mechanics, labourers, and their families	17	.	.	.	38

Now, if in the exhibition of the relative mortality of the two districts, no account were taken of the different position in life of the various classes of the population, but the low average of life in Manchester set forth, in comparison with what obtains in Rutlandshire, manufactures in all probability would be referred to as the cause of such a state of things; and, indeed, this was the actual mode of proceeding adopted by the members of Mr. Sadler's committee; certain returns, very imperfect in themselves, were adduced, and contrasted with others not legitimately comparable, because, with the exclusion of the factory system, not similarly related to the other possible causes of disease and early mortality.

The analysed results of our national system of registration have now clearly demonstrated that, in this country, a densely-populated district is less favorable to life than one but thinly inhabited; and the figures just quoted show that the result occurs, in a greater or less degree, in all ranks of life; and thus, in Manchester, where human beings are densely congregated, influences unfavorable to longevity extensively prevail; for we see that the value of life with the most favoured classes is not greater than with the least favoured in Rutlandshire. If it had appeared that, in the higher grades, there was little variation in the average age of death in the two localities, the difference in the pursuits of the workpeople in these places might to some extent have confirmed the idea regarding the specially injurious tendencies of manufactures. But the above facts, with many others of a like character, go to show that the evil appertains to *towns* rather than to *factories.*

Bethnal Green, a compact and thickly-populated part of the metropolis, a district where the existing evils of the great-town-system, so far as the poor are concerned, prevail to a very great extent, exhibits a highly unfavorable picture of human longevity, especially in the instance of those peculiarly subject to the evils in question. The following applies to Bethnal Green : from a population of 62,018,

Average age of Death.

" 101 gentlemen and persons engaged in professions, and their families   45 years.
 273 tradesmen and their families   26
 1258 mechanics, servants, and labourers   16."

From the above it seems that whilst in the first and second divisions the chances of life are greater in Bethnal Green than in Manchester, with the third a lower figure is attained. There are yet no factories in this place, the manufactory being chiefly domestic in the department of silk weaving.

As connected with the question relative to the prevalence of disease and death in manufacturing towns, and as tending to decide whether these evils flow essentially from the factories or from other causes, we will take Mr. Chadwick's figures and prefatory remarks as affecting Liverpool, the most appropriate subject of all for comparison with Manchester, for the reasons before expressed. The following occurs at p. 159 of the Sanatory Report :

"But in Liverpool, (which is a commercial and not a manufacturing town,) where, however, the condition of the dwellings are reported to be the worst, where, according to the report of Dr. Duncan, 40,000 of the population live in cellars, where one in twenty-five of the population are annually attacked with fever, there the mean chances of life appear from the returns to the registrar-general to be still lower than in Manchester, Leeds, or amongst the silk weavers in Bethnal Green. During the year 1840, the deaths, distinguishable in classes, were as follows:

Average age of deceased.

" 137 gentry and professional persons, &c.   35 years.
 1738 tradesmen and their families   22
 5597 labourers, mechanics, and servants, &c. 15."

Do not facts like the above justify and confirm the opinion which we have expressed that "the great mass of disease constantly witnessed in the districts where manufactures prevail and so often laid to their account, flows rather from the *great-town* than the *factory* system ?" Do they not suggest that agencies more powerful than manufactures are at work, whose effects, in the language of Dr. Farre applied to factories, go to " diminish population." Mr. Chadwick has some remarks so applicable just here, that we cannot resist quoting from him at some length :

" One most important result of such investigations would be to disabuse the popular mind of much prejudice against particular branches of industry arising from the belief that causes of ill health really *accidental* and removeable, and sometimes unconnected, are *essentials* to the employment itself. By pointing out the real causes, warning will be given for their avoidance, and indications extended for the application of more certain remedies. Medical men who see only a few patients of the same occupation at distant intervals ; who see them in their own dispensaries or in the hospitals, and who have no opportunities of observing such patients under the varied circumstances in which the disease may have been contracted, are left to mere guesses as to its cause. A working per-

son of any of the classes whose condition I have described, presenting himself with the symptoms of a consumption, the medical man has no means of detecting *the* one of many causes by which it may have been occasioned, and the individual patient himself is more likely to mislead than to inform him.   Unless his attention were accidentally directed to it, or unless the medical investigator had himself the means of observing the different personal condition of the different sets of persons following the same occupation in town and in country, it is highly probable that the evidence that the disease is not essential to the occupation would escape him.   Thus, between different sets of workmen who work at the same descriptions of work during the same hours, and in the same town, but in well or ill ventilated factories, a marked difference in the personal condition and general health of the workpeople has been perceived.   Great differences are perceptible in the general personal condition of persons working during the same hours in cotton mills in towns, and in cotton mills in rural districts, where they have not only a purer atmosphere, but commonly larger and more commodious places of abode.   The factory superintendants generally state that the workers in the country mills are distinguishable at sight by their more healthy appearance, and by the increased proportions amongst them who have florid complexions.   Very lately the attention of the Austrian government was called to the labour of persons working in the cotton-factories in the neighbourhood of Vienna.   One half, perhaps, of the mills are of the ordinary construction of the cotton mills in England of from thirty to forty years' date, and they work on the average as much as fifteen hours per diem.   But it appears that the houses in which the workers live belong to the capitalists who own the mills, many of whom have displayed a desire to ensure, as far as the state of the private residences can ensure, the comfort of those whom they employ, and they have accordingly built for them a superior description of tenements.   It is stated that the result of the inquiry conducted by the government physicians was, that the average health enjoyed by the workers in those mills is greater than that of any other class of workpeople in the neighbourhood where the mills are situated, and where the general condition of the population is deemed good ; the difference in the general health of the two classes (indicated by the proportions of death—of 1 in 27 of the general population, and 1 in 31 of the manufacturing population,) was ascribed to the difference of the residences." (Sanatory Report, p. 113.)

That factory labour in towns contrasts very unfavorably with agricultural pursuits, we have already maintained in opposition to Dr. Ure ; and that, with many other employments, it tends, under present circumstances, to deteriorate the race, we believe to be undoubted : the following from Mr. Chadwick's work is valuable, as illustrating this position :

" In the evidence of recruiting officers, collected under the Factory Commission of Inquiry, it was shown that fewer recruits of the proper strength and stature for military service are obtainable now than heretofore from Manchester. I have been informed that of those labourers now employed in the most important manufactories, whether natives or migrants to that town, the sons who are employed at the same work are generally inferior in stature to their parents. Sir James M'Grigor, the Director-general of the Army Medical Board, stated to me the fact, that 'a corps levied from the agricultural districts in Wales, or the northern counties of England, will last longer than one recruited from the manufacturing towns, from Birmingham, Manchester, or near the metropolis.' Indeed, so great and permanent is the deterioration, that out of 613 men enlisted, almost all of whom came from Birmingham and five other neighbouring towns, only 238 were approved for service." (p. 185.)

Birmingham, however, it will be remembered, is not the seat either of the cotton, wool, or silk manufacture ; it is yet one of our great towns. It would be tedious to reiterate the obvious inference.

Before we close the present disquisition, we shall examine somewhat
more in detail the specific evils alleged to result from the atmosphere of
cotton mills; these being particularly, the premature attainment of pu-
berty on the part of the female, osseous deformity, consumption, and
scrofula; we shall offer some remarks upon each of these allegations
respectively.   With regard to the first, we are satisfied that considerable
mistakes exist; we believe that the whole subject is one upon which many
erroneous views prevail.   It is a notion almost universally prevalent that
puberty occurs regularly, at an early or late period of life, according to
the high or low temperature of the place of habitation : it is taught for
example, systematically, that with the negress, the appearance of the
catamenia occurs some years earlier than with the Caucasian, in con-
sequence of the great heat of the climate in the former instance.   This
generally received statement, however, there is very good reason for be-
lieving rests upon no very satisfactory foundation.   On the contrary,
Mr. Roberton of Manchester, in a paper read before the British Associa-
tion at its last meeting held in that town, and since published in the
Edinburgh Medical and Surgical Journal, brought forward a series of
facts well authenticated, and promiscuously gathered, which go far to
discredit entirely this commonly received idea.   Our space will not per-
mit us to detail the facts in question, nor is it necessary for our present
purpose that we should; suffice it is say that, in our opinion, Mr. Roberton
has clearly shown that the notion respecting the influence of temperature
upon the period of puberty is at least *not proven*; and, further, that it is
probable that the idea is a mere conclusion from the analogy of the
vegetable world, having no sure basis whatever in direct observation.   It
is, at any rate, quite certain, that the effect of factories in this respect has
been inferred from considerations of this kind.   Mr. Roberton, with
abundant opportunities, has made this matter one of direct investigation,
and it has from him received no confirmation of the anticipations and
positive averments of Mr. Sadler's witnesses.   We ourselves have again
and again proposed the requisite inquiries for obtaining correct infor-
mation upon this head, in the full expectation of learning that, with fac-
tory girls, the age of puberty was much oftener below than above four-
teen.   We have kept no numerical records of the result of our inquiries,
but we are sure that this was, in the great majority of cases, in direct
opposition to our anticipation. In a word, we have the fullest conviction,
obtained from many opportunities of observation, that this particular
charge against factories is entirely unfounded.

On the subject of osseous deformity with the inmates of cotton mills,
we have already adduced considerable evidence to discredit the notion
that it is so constantly and uniformly met with as the Report of the
Factory Committee would have led us to believe.   With respect to this
matter, some very interesting information was brought before the British
Assocation at its Manchester meeting by Mr. Alderman Shuttleworth of
that town, whose paper read upon the occasion, is so replete with valuable
facts bearing upon the entire subject, that we shall here introduce por-
tions of an abstract of the same, taken from the work of Dr. Taylor before
noticed; by doing which, we shall enable the reader to judge, in some
measure, respecting the extent of the deleterious influence attaching to
the fine spinning mills,—that department of the cotton manufacture com-

monly regarded as the most prejudicial to health, and most conducive to the development of the special evils of the factory system.   The following is extracted from page 258 of the work of Dr. Taylor :

"The tables which I have to present to the section (the statistical) relate to the nineteen cotton mills in Manchester, which are engaged in spinning fine numbers of yarn. These are the whole of the establishments in this town so employed. As such mills require to be kept at a higher temperature than is necessary in spinning common numbers, it has been generally considered that the health of the workpeople engaged in them was exposed to more injury than in any other kind of factory labour. In consequence of this prevailing opinion, and as the conditions under which the fine spinners are placed are certainly somewhat peculiar, it was thought desirable, when the Factory Commission was appointed in 1833, to collect a body of information which should be confined exclusively to them as a separate and distinct class of spinners. The parties concerned in the inquiry, anxious to have the facts collected under such circumstances as to entitle the statement of them to every degree of confidence, requested me, as a person wholly unconnected with the spinning business, and having no interested feeling in the result of the investigation, to undertake the responsibility of conducting it. I accordingly drew up a series of questions, to be answered personally and individually by each operative spinner, to agents, consisting of professional accountants, and one of our most respectable and intelligent surgeons, who were employed to go through the mills and receive the answers from the workmen.   That the answers might be given considerately and after due preparation, every spinner was furnished with a list of the questions a day or two before the agents visited them to receive their replies. The facts and statements, thus most carefully and scrupulously collected, were then arranged by me under the heads exhibited in the tables, and afterwards delivered in evidence before the factory commissioners sitting in Manchester at the time, and their accuracy verified on oath by myself and the agents employed. . . . . The nineteen mills in question worked sixty-nine hours per week ; they employed 837 spinners who are adults, of whom—

"	16	are under 21 years of age.	
176	from	21 to 25	inclusive.
198	,,	26 ,, 30	,,
155	,,	31 ,, 35	,,
152	,,	36 ,, 40	,,
89	,,	41 ,, 45	,,
33	,,	46 ,, 50	,,
12	,,	51 ,, 55	,,
5	,,	56 ,, 60	,,
1	,,	above 60	,,

"Of the total number of spinners, 255, or nearly $30\frac{1}{2}$ per cent. were absent from work on account of sickness in the year 1832, an aggregate of $6296\frac{1}{2}$ days, or an average of $24\frac{1}{2}$ days for each of the 255 who were sick, or $7\frac{1}{2}$ days for the whole number of spinners employed. Of the 837 spinners, 621 or 74 per cent. reported themselves to enjoy 'good,' 171, or 24 per cent., to enjoy "*pretty good*," and 45, or about 2 per cent. to have '*indifferent health*.' . . . . .The married spinners had had 3166 children. . . . . .640 of these had worked in cotton mills, and 58 had worked at other employments. Out of the 640 who had worked in mills, 18, or about $2\frac{3}{4}$ per cent. were dead ; and out of the 58 who had worked at other employments, 4, or nearly 7 per cent. were dead.   *The cases of distortion were 8, or* $1\frac{1}{4}$ *per cent.*, and there were 7 cases, or rather more than 1 per cent. of mutilation from machinery."

The above facts, obtained with such precautionary care, and showing as they do certain results relating to the noxious agency of the most noxious class of cotton mills, are of very considerable importance. They furnish positive numerical data respecting matters upon which so much

vague declamation had seen hazarded; and they exhibit in a very ridiculous light, the exaggerated statements that had gone abroad, regarding the terrible influence of factories in the destruction of infant life, and the woful distortions of limb.

Among the peculiar evils of the factory system, the production, or pre-mature development of phthisis, seems to have been more generally dwelt upon than any of its other presumed ills.   The facts and statements of M. Villermé, noticed in the preceding pages, give an especial prominence to this presumed result of the cotton manufacture, traceable, in his view of the case, mainly to the bronchial irritation caused by the inhalation of dust and cotton flue, and exhibiting itself in a high degree among the batters and carders of cotton, classes of workpeople mainly subjected to this agency.   We confess, for our part, that when, in the discussion of any matter of this kind, great stress is placed upon the reasons why a certain consequence must follow, we are generally led to mistrust the ac-curacy of the fact itself.   We always suspect that the observer's attention is excited unduly by instances that seem to realize the expectation, and that what furnishes no corroboration of his anticipations is but little re-garded.   Medical men, in such cases, too commonly ascribe the results in the language of Mr. Chadwick, " of a cluster of causes to one ; and in respect to several classes of workmen, the real cause, the invariable an-tecedent, is unnoticed."   And thus—with minds prepossessed with the notion that tubercular consumption originates essentially in bronchial irritation, and that the atmosphere of cotton mills is exceedingly con-ducive to the development of this latter—every case of phthisis, occurring among the factory population, is sure to be attributed to the one presumed cause.   We ourselves believe that, in the present state of our information this peculiar influence of cotton mills is, to say the least, entirely without proof ; and, so far as our information extends, we think that any impar-tially selected, or promiscuously gathered body of facts would go to show that the idea receives no support whatever, when fairly put to the test. Amongst other communications elucidating this affair of factories, read at the British Association's last meeting, a paper, since published in the Journal of the Statistical Society, was read by Mr. Noble of Manchester; and as this paper illustrates, in some degree, this particular point, we shall here insert certain portions.

After exhibiting figures from the returns of the Registrar-general, showing that Manchester presents no unusual amount of deaths from con-sumption, as compared with other places, Mr. Noble thus sums up the issue :

"These numerical statements, of unquestionable authenticity, drawn from the national records of the causes of death in various parts of the kingdom, supply certainly no corroboration of the views that have been set forth as to the extraordinary prevalence of consumption in these districts, as compared with other localities differently situated in respect of manufactures. Manchester and Salford seem, on the whole, rather more exempt from the affection than some other places ; decidedly more so than Liverpool ; but, in comparison with the agricultural districts and the metropolis, they seem more subject to its pre-valence.   It is a remarkable fact, however, that the metropolis excepted, Man-chester has fewer deaths from consumption, in proportion to the whole number of deaths, than any of the other districts above instanced ; and, compared with the metropolis in this respect, the ratio is the same."

With a view of ascertaining whether, of the registered deaths from consumption in the township of Manchester, the factory population yielded an undue proportion, an examination had been made of the death books for the years 1838, 1839, and 1840; and the cases registered as deceased from " consumption;" " decline," and " phthisis," had been taken therefrom and recognized as cases of consumption; those below fifteen and above forty years of age at the time of death, having been excluded.   Mr. Noble, in explanation of this proceeding thus expresses himself :

" It is reasonable to suppose that, if occupation of any kind operate so as to shorten life through the production of such a disease as consumption, the affection will be developed and terminate fatally within those periods; and, again, I considered that in omitting, for the purposes of this inquiry the instances marked 'consumption' &c. below fifteen and upwards of forty, I should be most likely to embrace the largest amount of real cases, seeing that, in the record of the causes of death, infants of the tenderest age, even those below twelve months, are very frequently registered as having died from consumption; and, on the other hand, persons of very advanced years are similarly registered; there being a high probability that, in both these extremes, a large proportion of such instances have not been real cases, but in the example of children probably some chronic mesenteric affection, and in that of persons past middle life cases most likely of chronic bronchitis with general decay.   Not that I feel any confidence of having obtained by the present plan instances only of true consumption, for many deaths from other organic affections, especially of the heart or liver, are in all probability registered, on the imperfect report of those supplying the required information, as from ' decline'; and others, real consumption, are probably given in as 'disease of the chest' or 'weakness;' but, on the whole, I believe that, as regards *numbers*, a very fair accuracy will be gained, the improperly included being balanced by those unduly excluded."

After this explanation of the way in which he was guided in prosecuting the analysis, Mr. Noble goes on to say that,

" The township of Manchester with a population of about 160,000, and with an average of deaths annually of 6000, afforded 1141 registered deaths from consumption in the three years before mentioned; and, as nearly as can be estimated, 174 of these occurred to individuals working in factories, a proportion somewhat more than one seventh of the whole; whilst 590 were of persons registered as of various occupations; and 377 without any stated employment, having for the most part been wives and children not attached to any particular pursuit.   Of these 174 inmates of factories, the spinners constituted 45, the winders 49, the piecers 28, the reelers 15, carders and frame tenders each 11 ; 10 were stated to have wrought in factories without there being any mention of the precise occupation; and the remainder were of doublers, stretchers, batters, &c.; none of them exceeding 5 in number...........Now, when it is considered that the actual *township* of Manchester includes the more central and dense part of our population, I do not think it too much to say that of the inhabitants between fifteen and forty, not very much less than one seventh of the whole are employed in factories; and, if so, no corroboration is afforded of the notion that consumption is disproportionately prevalent amongst the factory population."

Mr. Noble afterwards proceeds to show by further analysis, that the population of Manchester is not at all more liable to *early* invasion of the fatal malady than that in other places, contrary to the general idea entertained upon the subject.

The above facts show satisfactorily to us that, whatever may occur in the manufacturing towns of France, where probably certain other conditions of health may be less favorable than in this country, the factory system does not lead necessarily to the undue prevalence of consumption. In no place do cotton mills abound so extensively as in Manchester, leading to the presumption that if there be anywhere as mentioned by M. Villermé, a " *cotton-phthisis*," it is an accidental and not an essential appendage.

We have a few words to say respecting the extraordinary amount of scrofula in the manufacturing districts, and the unparalleled abundance of cases to be noticed in places like Manchester.   Now we can easily understand how Mr. Malyn saw an immeasurably larger number of cases of scrofula when in Manchester, than during his subsequent metropolitan career, as stated in his evidence before parliament.   In Manchester, he tells us, that, as physicians' clerk at the infirmary, his business was extensively with the most destitute classes; we presume that his professional pursuits were somewhat of a different character in London, bringing him at any rate into communication less with the lowest social grades ; on which account he would not be so likely to encounter scrofulous disease as under his former circumstances.   In all investigations of this kind, however, we can attach but little value to the results of partial observation, or to any aggregate of facts which have not been obtained generally and promiscuously.

With a view to illustrate this present matter, we propose to select certain figures from the Registrar-general's report for 1839, now before us; and we shall employ the returns of the deaths from consumption a little differently from what Mr. Noble seems to have done in the paper from which we have just quoted.   Some little acquaintance with popular modes of dealing with these matters satisfies us that the cases of death reported to the registrar as *decline* or *consumption*, are representative of general scrofulous disease rather than of phthisis exclusively.   A consumption or decline, with the mass of the lower orders, is expressive of most diseases unaccompanied by acute symptoms, and marked by progressive emaciation ; and we are sure that, where the scrofulous taint prevails extensively, the cases of death registered as decline and consumption will on this account be in excess.   Hence, we think it somewhat presumable that in those localities where, of the whole number of deaths registered, the proportion of consumption cases is great, the existence of much scrofula may be inferred.   We do not propose this scheme as an undoubted test, but as one furnishing an *approximation* to the probable fact.

We take the several towns, analysed with respect to these matters, as they occur in the Report of the Registrar-general.   Thus, in the exceedingly mixed population of the metropolis, out of 45,441 deaths, 7104 were in 1839 registered as from consumption, being in the proportion of 1 in $6\frac{1}{3}$; in the cotton districts of Manchester and Salford, 9223 deaths furnished 1454 cases of consumption, being in the same proportion as in the metropolis ; in commercial Liverpool, all but exempt from manufactures of any kind, 9181 deaths gave 1762 instances of consumption, or 1 in $5\frac{1}{3}$; in the case of Leeds, the seat of the woollen

manufacture, a total of 4388 yielded 804 of consumption, or 1 in $5\frac{1}{2}$; and Birmingham, where there are no cotton mills, 3639 deaths included 668 cases of consumption, or 1 in every $5\frac{1}{4}$.   So it would appear that Manchester, with its factories, exhibits, in its fatal cases of disease, a somewhat moderate proportion of those here presumed to be of a scrofulous character.   Just then to the extent that the test we have here applied may be considered to possess any value, it tends to disprove the notion regarding the extraordinary prevalence of scrofula in the districts of the cotton manufacture.

In closing the present article, we think ourselves entitled from all that is gone before to conclude that no peculiar evils to health and life attach, necessarily, to manufacturing pursuits.   That the position of the labouring classes, as a whole, is comparatively prejudicial in these respects, we believe to be pretty well made out; and this, more particularly in the case of such as inhabit the ill-conditioned localities in our large towns; and in so far as factories, and other corresponding places of labour, interfere with the right conditions of health, they of course lead to the production of disease and to the shortening of life. We think however that, upon a review of the facts and circumstances considered in the preceding pages, the evils afflicting the working classes in this point of view will be considered to appertain to their *domestic* rather than to their *industrial* relations; and yet, badly as we think of the hygienic state of many of our cities, we cannot go the lengths of Sir A. Carlisle in his parliamentary evidence, in concluding that, because he could not find a person of the fourth generation by both the father and mother's side in the city of London, therefore our towns would undergo depopulation in a comparatively brief space of time, if not refreshed by accessions from the country. When the migratory character of our town populations is considered, we do not think Sir A. Carlisle's fact very extraordinary; and, assuredly, it warrants no such conclusion as the one which he seems to have deduced. Great evils undoubtedly follow in the train of advancing civilization; but, in the phraseology with which we set out, they must be regarded, not as something inseparable from such a state of things, but as the result of that imperfection of humanity, which, in no instance, can anticipate with a view to provide for every possible consequence of social changes, allowing man to become enlightened, not in all things at once, but only progressively.   In admitting most fully the evils of our present state of society, we cannot too much reprobate the folly of those who would fasten upon isolated points, and expend their humanity and energy in decrying special departments of industry, rather than with a more general philanthropy, and with a sounder judgment, in probing the real source of the attendant evil, so as to ascertain how its removal can be effected without the infliction of greater evils upon the community at large.   When from party-spirit, or from excited imagination, or from eccentric modes of looking at particular subjects, statements are hazarded to the effect that, as before quoted, "in English factories everything which is valuable in childhood is sacrificed to an inferior advantage in childhood.   You purchase your advantage at the price of infanticide; the profit thus gained is death to the child;" or, when a depopulation of cities in fifty years is proclaimed to be the natural consequence of their existing ills; the investigation of the real question is prejudiced;

and men, revolting from the exaggeration, too readily shut out the prospect of the real evil, and deny its existence.   It is much better to regard the entire subject from a more general point of view, and to discuss the sanatory condition of our labouring population as a whole. In this way, all irritating topics may be avoided, and an effective effort be calculated upon with a view to provide the appropriate remedies for the removeable ills that do actually exist.

Art. II.

Dissertatio Obstetrica Inauguralis de Prolapsu Funiculi Umbilicalis. Auctore Joh. Christ. Saxtorph.—*Havniæ,* 1842.

Obstetric Inaugural Dissertation on Prolapsus of the Umbilical Cord. By J. C. Saxtorph.—*Copenhagen,* 1842. Two Parts. 8vo, pp. 64, 68.

It has long been a matter of regret to us that the medical theses of this country have been rather looked upon as a matter of mere form connected with the process of graduation at a university, than as a means for test- ing the knowledge and abilities of the student, still less as the early at- tempt in authorship of a young man who is thus giving his first earnest of what he *can* and of what he one day *will* do.   In the medical univer- sities of the continent this is not generally the case; a large number of inaugural dissertations are yearly put forth in the German, Dutch, Danish, and Swedish universities, which bear the marks of much learn- ing and inquiry, and sometimes so much original research as to make them valuable additions to our literature.   We could enumerate very many such not only in former times, but in later years; in many instances they have been the commencement of still more extended investigation and discovery, and have paved the way to the future distinction and ce- lebrity of the young author.   To the medical professors of the continental universities is due much credit and praise for the exertions which they have made to rouse into activity the talents of their pupils in their first attempt at authorship, and by a little judicious interest and assistance to encourage them in their undertaking; hence it is customary for a professor to reserve any observations which he might have been inclined to publish in his own name for the theses of one of his most distinguished pupils of that year; and having put him in possession of the various facts which he may wish to communicate, leaves him to work up the literature of the subject, and to give a digest of whatever may have been known about it. It is, we presume, in great measure owing to this excellent custom that the continental theses are so very superior to the generality of those coming from Edinburgh; although we are far from wishing to deny that occasionally some of considerable talent emanate from our respected alma mater, and we have no doubt that, with a similar degree of encourage- ment, they would rise to equal or even greater merit, and add fresh lau- rels to her well-earned fame.

The name of the author in the present instance is a sufficient voucher for talent and respectability to claim our favorable attention.   He comes of a family long distinguished in the profession, more especially in the obstetric part of it; and we can say with pleasure that he has not shown himself unworthy of his distinguished predecessors.

M. Saxtorph enumerates in his first page the various morbid conditions and mechanical causes by which the functions of the cord may be interfered with or injured, and which, from his extensive researches, amounts to a larger number than those who have not paid much attention to the subject would suppose. Its circulation may be impeded by coils round the different parts of the child, by actual knots, by contortions, or by rupture, or by organic changes—as dropsy of the cord, varices, aneurisms, or stricture; it may be filled with hydatids or surrounded by indurated gelatinous matter.

In order to ascertain the relative frequency of prolapsus of the cord our author has endeavoured to collect, from a variety of sources, a very considerable number of these cases, and the result of his inquiries is that, out of a grand total of 116,277 births, prolapsus of the cord occurred 480 times, or in the proportion of 1 in 242. This is not very far from the result of a similar inquiry by Schuré, who found that, in 60,148 cases collected at different hospitals, the cord had prolapsed in 226, or in the proportion 1 in 226.

M. Saxtorph has very properly discountenanced the opinion that prolapsus of the cord is more liable to occur with some positions of the child than with others, and has shown that it may occur with any. He has put the results of his inquiries into a tabular form, which we subjoin not merely in proof of this fact, but because of its value as a statistical reference;

	Prolapsus of the cord.	Head Presentation.	Presentation of the head and extremities	Nates presentation.	Feet presentation.	Oblique presentation (arm or shoulder.)	
Michaelis	27	19	3		5		
Me. Boivin	38	32	6				
Mauriceau	39	17	5		5	10	2 abortions.
De la Motte	14	10	4				
Me. Lachapelle	36	23	9	1	1	2	
Me. Lachapelle	41	32	7	2			
Dr. Collins	97	79	7	2	9		

The author has pointed out the action of the inferior segment of the uterus in surrounding the presenting part of the child so closely as to prevent the funis, under ordinary circumstances, from prolapsing; hence we can easily understand why prolapsus of the cord should be chiefly seen where the uterus has been distended with a large accumulation of liquor amnii, and whereby it has been rendered so spherical that the inferior segment could have no effect in preventing the cord from slipping down between itself and the presenting part. He refers to Professor Michaelis's valuable paper on this subject, of which we have ourselves given an abstract in the First Volume of this Review, (p. 588,) and to which we must refer our readers. The other causes which have been assigned, viz. contracted pelvis, malposition of the child, retort-shaped uterus, with pendulous abdomen, are all, in our opinion, of very doubtful effect; and, like most other authors of the present day, the author omits to mention the child's death as a cause; a circumstance which decidedly has a considerable effect in determining the prolapsus of the cord, and upon which, we suspect, it mostly depends where it occurs in conjunction with a

contracted pelvis or an arm or shoulder presentation. Still less can
we suppose that the cord being entangled round different parts of the child
could act as a predisposing cause, as Mauriceau appears to have stated,
and also, more recently, Deneux ; we must, however, do our author the
justice to say that he merely mentions these as the opinions of different
authors, adhering to none in particular himself.

He has devoted considerable attention to the interesting fact which
Professor Naegele, jun. has lately brought again under the notice of the
profession, viz. that where the placenta is inserted near to the os uteri
and the cord rises from its lower edge, prolapsus is very likely to occur :

" Levret (1751) pointed out the fact that the lower the placenta was situated
towards the os uteri, the nearer the cord was inserted into the edge of it, and
generally at that part where it was in closest proximity to its edge. Zeller, in
1806, showed that the vicinity of the placenta to the os uteri might be an occa-
sional cause of prolapsus of the cord. We also find several cases recorded in
Stein of prolapsed cord, where the placenta was situated in the inferior segment
of the uterus, with the cord inserted into its lower margin. Deneux has col-
lected some cases from Mauriceau and Smellie where prolapsus of the cord has
been accompanied with attachment of the placenta near the os uteri. Dr. Haase
relates a case of prolapsed cord in which the placenta was attached to the edge
of the os uteri ; the cord was returned with difficulty, coming down continually ;
it was sixteen inches long, and partly inserted into the membranes. Busch has
observed many cases in which the prolapsus of the cord was apparently owing
to its length and insertion into the edge of the placenta, in two of which it was
attached near the os uteri. Dr. Churchill also mentions that in prolapsus of the
cord he has repeatedly found the placenta attached near the os uteri, in some
of which the cord has been inserted into the edge of the placenta, and which he
considers as one of the causes of prolapsus. Carriere d'Azerailles, who is of
opinion that the bruit de soufflet is a certain indication of the spot where the
placenta is attached, mentions that in twenty-six cases where this sound was
heard at the lower part of the uterus, the insertion of the cord was not central,
and in some cases where the prolapsus of the cord had required either turning
or the forceps he affirms that when he introduced his hand along the cord up to
its insertion in the placenta he not only found this quite at the edge, but such
that when the membranes gave way the cord unavoidably prolapsed. Still, as
we have before observed, none of these authors looked upon this circumstance
as one of the chief causes of prolapsus of the cord. F. H. Naegele was the first
who paid particular attention to this subject and to its prognosis and treatment.
He has described five cases of prolapsed cord accompanied with insertion of the
placenta near the os uteri : the cord in every instance was inserted into the edge
of the placenta and invariably on the side which was nearest to the os uteri, and
in two cases it was even inserted into the membranes, so that its vessels for the
space of an inch were separate before they reached the edge of the placenta.
He has also communicated an examination of fifty placentæ, all of which he found
attached to the lower and lateral portions of the uterus, in two only of which he
found a central insertion of the cord, in the rest its distance from the edge varied
from an inch and a quarter to an inch and a half ; in eleven cases the cord was
inserted near the upper edge of the placenta, in all the others near the lower
edge. He therefore considers that the insertion of the cord near the orifice of
the uterus must decidedly be looked upon as an important predisposing cause
of prolapsus, and especially so the nearer the cord is inserted into that edge of
the placenta which is nearest to the os uteri. If the edge of the placenta reaches
to the os uteri and the insertion of the cord is at this spot, or still more if the
umbilical vessels are distributed upon the membranes at a little distance from
the edge of the placenta, presentation of the cord becomes a necessary result,
so that when the membranes give way prolapsus becomes unavoidable." (p. 34.)

This coincidence of circumstance is doubtless very curious, and in a practical point of view well worthy of attention; we can quite imagine that the insertion of the cord into the lower edge of the placenta which is bordering closely upon the os uteri, would render its prolapse almost unavoidable; but our own numerous cases of partial presentation of the placenta where the insertion of the cord has *not* been marginal convince us that this circumstance is not so invariable as Professor Naegele, jun. would suppose. If it were we ought to meet with prolapsus of the cord in the majority of cases where the placenta was partially presenting : but experience proves that it is not so.

M. Saxtorph, in pointing out the mortality of children where the cord presents, which is so large that out of 356 births only 161 children were born alive, endeavours to investigate the different sources of danger to the fœtus, in doing which he brings much interesting matter to bear upon his subject. He shows that the degree of cold to which the cord may be exposed when prolapsed will rarely act injuriously upon the child's life, and that it is the pressure upon the cord during labour which is the cause of death. Hence it is that the membranes remaining unruptured until an advanced period of labour is so important in ensuring the birth of a living child in these cases. The author gives an excellent summary on this point, which is worthy of notice :

"So long as the membranes have not given way experience proves that the cord presenting is but little affected by pressure, so that it still retains a strong and firm pulsation. We have shown that so long as the membranes are unruptured the cord which presents may change its position, and thus avoid compression. If the membranes remain whole whilst the presenting part descends into the cavity of the pelvis, and if the early stages of labour are retarded, it generally happens that the last stage, during which the prolapsed cord is particularly exposed, passes over very quickly, which is of the greatest importance in preserving the life of the child, if we have left the case to be completed by the natural effort. Moreover, if we consider that hastening of the labour by artificial extraction is indicated, nothing can be a greater assistance to the operation than the membranes being unruptured. If the child is to be delivered footling, the head still remaining moveable at the upper aperture of the pelvis, the membranes being unruptured afford greater mobility of parts. Lastly, if we think it right to wait whilst the head is pressed deeply into the pelvic cavity in order that it may be extracted by the forceps, it will be less dangerous to the life of the child to wait the time which is necessary for the operation whilst the membranes are still whole." (Part ii. p. 14.)

Although a firm, turgid, strongly pulsating cord be an undeniable proof of the child's life, experience has shown us that we are not to come too hastily to the opposite conclusion, viz. of the child being weakly or dead because the cord is thin, soft, and without pulsation ; for cases every now and then occur which show that, even with this state of the cord, life was not extinct. The entire extinction of pulsation in the cord, which is usually looked upon as a certain proof of the child's death, is a symptom which must be taken with some degree of caution ; for cases have occurred which show that even here we are not justified in giving up hope. The instance which Dr. Evory Kennedy has related proves this very strongly. M. Saxtorph has examined this important point very thoroughly, and collected some very interesting evidence upon the subject.

"We find in numerous authors so many cases recorded of a child being born

alive where the cord had been some time prolapsed without any pulsation that there is every reason to suppose that life is not always extinguished simultaneously with sensible pulsation, nor ought we to suppose that the safety of the fœtus is so dependent on the interval which has elapsed since the last pulsation as to feel justified in desisting from every attempt to preserve the child because we can detect no pulsation in the prolapsed cord. We will quote a few instances where the life of the child had been preserved by the aid of art, although the cord had ceased to beat for a considerable time. Thus, Huëter has given a case of a woman in her third labour, and where the midwife had sent for him on account of the cord being prolapsed. He found the head in the first vertex position, and close by the lambdoidal suture a considerable coil of a slender cord without any pulsation, all motion of the child had ceased, the liquor amnii came away putrid and mixed with a large quantity of meconium. Since it was therefore so doubtful that the child's life could be saved he thought it needless to attempt artificial extraction, and merely returned the coil. As the pains increased a living child covered with meconium was born in a few hours by natural efforts. Busch has given the case of a primipara, aged thirty-two, who was brought into the Lying-in Hospital from a distant part of the city in a winter's morning, when the thermometer was at 14° Fahrenheit. She had been sent thither by the midwife, after having had pains through the whole night; towards morning the membranes had burst, and a large coil of cord had prolapsed externally. He found a coil of cord, more than six inches in length, hanging from the external parts, cold and without pulsation; the child was presenting with the nates in the first position, and the os uteri nearly dilated. Having put the cord into warm water he was after a while enabled to perceive weak pulsations, and therefore turned the child, brought down the feet and delivered the head afterwards with the forceps. The child, although born in a state of asphyxia, recovered in half an hour. A similar case occurred a few years ago at our own lying-in hospital, which Professor Eschricht kindly communicated to me. A woman in whom labour had already commenced and where a coil of cord was hanging from the external parts, came to the hospital on foot during a very severe winter's night, from a distant part of the town, called Christianhoevn. On being admitted the loop of cord, which was cold and without pulsation, was enveloped in cloths wrung out of hot water. A feeble pulsation was restored, the child was turned and delivered alive." (Part ii. p. 18.)

It has been shown that the position of the cord in the pelvis is very far from being immaterial, as regards the danger to the child's life. The same rule that has long since been taught by Naegele, viz. that in all footling births, whether originally presented with the nates or feet, or the feet having been artificially brought down in the operation of turning, it is very desirable to direct the cord towards one of the sacro-iliac synchondroses, as being more safe from pressure in this situation; so in presentations or prolapsus of the cord experience shows that the prognosis will be a good deal influenced by the position of the cord. Boer considered that the anterior part of the pelvis is the most dangerous for the cord. In the elaborate report which Professor Busch published of the cases at the Berlin Lying-in Hospital, occurring between 1829 and 1835, of thirty-nine cases of prolapsed cord he found that the child's life was more endangered when the cord was in the anterior parts of the pelvis, even before the membranes were ruptured, where the pains were strong.

M. Saxtorph has also investigated very carefully the manner in which death is produced by pressure upon the cord; and having studied most of the pathological investigations upon the subject, comes to the conclusion that it is identical with asphyxia. A variety of opinions have been broached on this point, some considering that death was produced by

anemia and syncope, others by plethora and apoplexy, and others by suffocation and asphyxia. The appearances after death appear to justify the conclusion that it is the latter cause:

" On external inspection most observers have found the surface livid, occasionally, nevertheless, pale ; most frequently marked with distinct livid spots. (*Zeller*, *Capuron*.) The nails, tips of the fingers, and face are livid ; this, however, varies, but still the discoloration is pretty uniform in the lips.   The globes of the eyes and tongue are swollen, (*Mende* :) this latter is seldom protruded beyond the mouth. The cavities of the mouth and nose contain a bloody mucus, and sometimes liquor amnii mixed with meconium, (*Dubois* ;) the face is usually placid, as of an infant asleep ; the extremities, especially the fingers and toes, spasmodically contracted. (*Schmitt*.) The epigastric region is but little expanded (*Wigand*), and the external surface of the body is often smeared with meconium if this has been mixed with the liquor amnii. (*Busch*, *Dubois*.) In the upper and back part of one or other of the parietal bones, on removing the cranial integuments, a gelatinous fluid, sometimes mixed with extravasated blood, but rarely pure blood, is found. The cranial bones are as injected with red blood as if it had been done artificially. The venous sinuses, the vessels of the dura and pia mater, and of the brain, are so gorged with blood, that innumerable minute drops of blood exude by the slightest pressure on the brain. The above extravasated, bloody, or gelatinous fluid is rarely found at the base of the brain, on its surface, or in the ventricles. This appearance has induced many authors to consider that apoplexy has been the cause of death...... In the thoracic cavity, if the child has not breathed and no attempts have been made to inflate the lungs, we shall find the pericardium covering the lungs, and containing but a small quantity of serous fluid. The heart distended with black blood, seldom coagulated into a polypoid form. The coronary and proper vessels of the heart are so gorged that they could not have been more finely filled even by the most successful injection. The vena cava and other large veins are full of blood, but the arteries generally empty.......... The lungs, in the cavities of the pleura, collapsed, like liver in appearance, dense, compressed, of a dark red colour, and sinking in water.... ...In the abdominal cavity *Kohlschwetter* in two instances has found the liver so gorged with black blood as to resemble one large coagulum. This has also been confirmed by many others.'' (Part ii. p. 34.)

In the treatment of prolapsus of the cord various modes have been adopted by different authorities.   1st. To leave it entirely to nature. 2d. To replace the prolapsed portion and retain it there ; and then either to let the labour take its course, or terminate it by art.   3d. To turn the child with or without artificial extraction.   4th. To terminate the labour by the forceps.

We have already referred to our former notice of Professor Michaelis's interesting observations on the reposition of the cord ; it is a subject which we again recommend to the attention of practitioners, and feel justified in so doing, from the fact that in twenty-five cases of prolapsus of the cord he has succeeded in saving the lives of twenty-one children by the reposition. The arguments for and against these different modes of treatment are subjects which are sufficiently considered in the modern midwifery, not to require our entering upon them.   There is no doubt but that the treatment will vary much according to the circumstances of the individual case, and that in many instances the forceps proves of great value either in delivering the head which presents, or in the latter part of a delivery where the child has been turned.   To Professor Busch, of Berlin, are we much indebted for pointing out the value of the forceps in all cases threatening pressure on the cord during the passage of the head,

by which means he has rendered turning a far more successful operation, as regards the child's life, than ever it was before.

M. Saxtorph's essay does him much credit; and we feel assured we cannot pass a better compliment upon it than by saying that it is well worthy of his name.

ART. III.

1. *Traité Pratique des Maladies des Enfants, depuis la Naissance jusqu'à la Puberté.* Par E. A. J. BERTON, D.M. &c. 2ième édition, entièrement refondue.—*Paris,* 1842. 8vo, pp. 823.

A *Practical Treatise on the Diseases of Children, from birth to the period of puberty.* By Dr. E. A. J. BERTON. Second edition, entirely rewritten.—*Paris,* 1842.

2. *Traité Pratique des Maladies de l'Enfance.* Par F. BARRIER, D.M. Tome Premier.—*Paris,* 1842. 8vo, pp. 735.

A *Practical Treatise on the Diseases of Childhood.* By Dr. BARRIER. Vol. I.—*Paris,* 1842.

THE diseases of childhood have of late years attracted peculiar attention in France. The immense hospitals of Paris afford an ample field for their investigation, and the large number of recent publications on the nature and treatment of these affections, bears testimony to the zeal with which it is cultivated. M. Valleix's *Clinique des Maladies des Enfans,* which appeared in 1838, was followed in the succeeding year by the *Traité Pratique des Maladies des Enfans* of M. Richard of Nancy. In the year 1841, a monthly journal for children's diseases was set on foot,* and 1842 had scarcely commenced when the books whose titles are at the head of this article made their appearance, both thick and closely printed octavos, and one being only the first volume of a work which will probably extend to two more before its completion. M. Becquerel, the laborious *ex-interne* of the Hôpital des Enfans Malades, has published the first number of a treatise on the diseases of children, which is to appear in parts, and a complete work on the subject by MM. Rilliet and Barthez, so favorably known by their essay on pneumonia in children, is in the press, and will be published before the close of the year.

Valuable as many of the observations are which these works contain, we yet cannot suppress a feeling of disappointment at the smallness of the results which have followed so much labour. Instead of confining themselves to the patient investigation of some one disease, these writers have taken a wider range, and have treated of all the affections incidental to childhood. They have presented us not with monographs, but with so-called complete theoretical and practical treatises, which abound in facts incompletely observed, and in conclusions drawn hastily from insufficient premises, and which lead us to a region of doubt and uncertainty. The brief period of an *internât,* no small part of which must be spent in learning to observe, is far too short to qualify any one for writing on all the diseases of children, and the opportunities of after life are in most cases inadequate to supply this deficiency. Thus we find M. Berton publishing in 1842 a new edition of his Traité des Maladies des Enfans, which

* La Clinique des Hôpitaux des Enfans. 1re année.—Paris, 1841. 8vo.

contains three hundred pages more than the former one; but this addition consists of the opinions, worthless as well as valuable, of all who have written on the subject within the last seven years, not of the results of the author's greater experience and maturer judgment.

Both of the works now before us illustrate the defects of which we have been complaining; from both, however, much may be gleaned that is worth knowing, and to this more grateful task we now apply ourselves. In an introduction of fifty pages, M. Barrier propounds a theory of life, which he wishes should serve as our guide in the management of childhood and its diseases. The vital force, says he, is strongest in the fœtus, stronger in the infant than in the child, in the child than in the grown man. With the advance of age the instrument becomes indeed more perfect, but the power which formed it progressively decreases till death. Strangely enough, M. Barrier seems to fancy this theory to be a novelty; a discussion of its merits would be out of place here, but the fact of the vital force being so strong at the age of virility as to multiply itself by the formation of germs, affords a most powerful argument against a hypothesis of a gradual and progressive waning of the vital force from the period of birth.

Turning from speculation to fact, we light upon some remarks by M. Barrier on the comparative prevalence of different diseases in childhood. His observations are too few to warrant any positive conclusions, but they will be interesting for comparison with more numerous data at some future time. It appears that of 412 cases which occurred in male children between April and October, 1838, two fifths were affections of the chest, one fifth of the abdominal viscera, one fifth of the organs of the senses; in one tenth the nervous centres were affected, and in one tenth various diseases existed not referrible to any of the above classes. Of diseases of the chest, pneumonia was by far the most frequent, and in three cases out of four it assumed the lobular form. Diarrhœa existed in half of the instances in which there was disorder of the abdominal viscera. The commonly received opinion of the great frequency of cerebral disease in childhood needs some qualification. Cerebral affections are frequent in childhood as compared with after years, but not as compared with the other diseases incidental to this period of life.

Early infancy is well known to be the time at which the mortality of the human race is highest; but it further appears that between the ages of two and fifteen, the greatest number of cases of illness occurs in the first and last years of childhood. Another fact which results from M. Barrier's researches is, that among a given number of sick children the tendency of their diseases to complications is in a direct ratio to the youth of the patients. The age of children likewise influences their liability to different diseases, as is shown by the following table, which represents the frequency of different classes of affections at three periods of childhood.

			Years. From 2 to 5	Years. 5 to 8	Years. 8 to 15
1. Diseases of the chest	.	.	42	46·50	40
2.	,,	abdomen . .	22	12	25
3.	,,	nervous centres .	9	6·50	5
4.	,,	organs of the senses	21	26	19
5.	,,	various parts .	6	9	11
			100	100	100

In further elucidation of this table, M. Barrier goes into particulars at p. 14, which we pass over. His fourth class is very unfortunately selected, including as he does under it all the eruptive fevers, as well as diseases which could strictly be called those of the organs of the senses.

We have on former occasions alluded to the high mortality at the Hôpital des Enfans Malades, and to the tendency of diseases occurring there to assume a complicated form. M. Barrier confirms the statements of previous writers, and likewise enters into an inquiry as to the causes of this mortality, some of which appear to admit of an easy removal, while others are, we fear, inseparable from an hospital for children. The cold in winter, and the heat of summer, together with the stinging of the gnats which infest the wards and keep the children in a state of constant irritation, operate very unfavorably upon the patients. The impossibility of varying the diet so as to suit the caprices of the children seems not to be without injurious effects, while very mischievous results follow from the ill-judged fondness of relations, who bring sweetmeats and pastry into the hospital on visiting days. The absence of a distinct ward for the eruptive fevers has had a very unfavorable influence on the mortality in the institution, those diseases frequently attacking patients admitted for other affections, in which case they invariably prove more fatal than when they constitute the primary affection. The want of a sufficient number of nurses, however, is the greatest defect at the Hôpital des Enfans. In a ward containing forty-five beds, the attendants consist of one sister and three nurses, and at night the whole charge of the patients is entrusted to one female. It is easy to conceive the evils which must result from such a system, and the great good which would be produced by increasing the number of nurses, but we doubt whether it is possible without an enormous expenditure of money to afford to young children suffering under acute diseases as good a chance of recovery in the wards of an hospital as they would have in the homes of their parents.

Two hundred pages of M. Barrier's book are occupied with the consideration of pneumonia, but we find in it little which needs mention after our recent notice of the treatise of MM. Rilliet and Barthez. There is, however, one point of great practical importance to which both M. Barrier and M. Berton refer, namely, the frequency of pneumonia unaccompanied by any well-marked symptoms, or marked by those which are characteristic of diseases of other organs than the lungs.

"In many cases," says M. Berton, "this disease appears under the form of a simple acute bronchitis, and runs its course in as short a time as that malady : in other instances the degree of emaciation to which it reduces the patient, and the slowness of its advance towards a fatal termination, might lead any one to mistake it for phthisis. This is the case more especially when pneumonia attacks patients of weak constitution and in feeble health, when it coexists with other affections and advances in a latent manner ; circumstances by no means unusual, since it seldom happens that marks of inflammation of the lung are found in young subjects, without other lesions being discovered elsewhere. Numerous affections either usher in or come on during the course of pneumonia in children. The complication of inflammation of the lungs with cerebral symptoms is by no means unusual, and always of very serious nature." (Berton, p. 373.)

The complication of pneumonia with gastro-enteritis we believe to be much less common in this country than at the Hôpital des Enfans. Its coexistence with cerebral symptoms, so grave as to throw the pulmonary

affection quite into the background, is, however, by no means rare.   The difficulty of diagnosis in this case depends, as M. Berton correctly remarks, much on the class of symptoms which made their appearance first. If the pneumonia be consecutive it often becomes developed, and makes great advances unnoticed, while the attention of the practitioner is engrossed by the symptoms indicative of disturbance of the nervous centres. In these cases the inflammation of the lung betrays itself only by a slight cough, and even that sign is sometimes wanting.   The medical attendant directs his treatment to the removal of the cerebral affection, and while congratulating himself on having been successful, has the mortification to lose his patient by a disease the existence of which he had not suspected, or which at any rate he had supposed to be nothing more than a trivial complication of the graver malady.

Delirium and coma are almost the only forms of cerebral disturbance which coexist with pneumonia in the adult.   In the child, however, the cerebral symptoms are much more varied.   Violent convulsions sometimes occur, accompanied with twitchings of the limbs or paralysis of some of the extremities, and occasionally those symptoms come on without previous convulsions.   Sometimes the symptoms so closely resemble those of ordinary hydrocephalus, that, without having recourse to auscultation, the most acute and well-practised observer might be deceived, and yet on examining the body after death, the brain appears quite natural, or a slight and scarcely appreciable congestion is the only point in which it differs from a perfectly healthy state.   But, difficult as the diagnosis of pneumonia may be in some cases, that of pleurisy is often still more obscured by similar causes.   The head affection which accompanies it, and often ushers it in is more violent than in pneumonia; the child's restlessness renders auscultation less easy, and the signs which auscultation furnishes are less clear and more readily overlooked than those which announce inflammation of the lung.

Pleurisy is not, as the statement of some recent writers might lead the student to suppose, a disease of rare occurrence in the young subject. The laborious dissertation of M. Baron, some of the results of which are presented to us by M. Berton (p. 447), has set at rest the question on which very conflicting opinions had prevailed. He met with traces of pleurisy in the bodies of 159 out of 403 children, or in rather more than one in three.   From his researches it further results that the frequency of pleurisy differs greatly at different periods of childhood; that it occurs oftener during the first five days after birth than at any other time in the first month of infancy; that it diminishes in frequency from the first month to the second year; that from the second to the third year it is more frequent than from the third to the fourth, or from the fourth to the fifth year.   It continues rare during the remainder of childhood, and is especially so from the thirteenth to the fourteenth year.   M. Barrier (p. 243), whose observations were made among children from two to fifteen years of age, states that he has never met with a case of pleurisy unconnected with pneumonia in children under six years old; that from six to ten it is rare; but that from ten to fifteen it is as frequent as in the adult.   The number of cases from which he draws this conclusion is not stated by M. Barrier.

M. Berton's work is decidedly of far greater value than that of M.

Barrier, though one of the most unreadable books we have ever met with. It is impossible to present our readers with an analysis of it, since it contains above 120 cases of different diseases, some well, others ill reported, and which all seem to have been transferred from the writer's note-book without selection or revision. A passion for publishing cases, similar to that which has taken possession of the French school, prevailed throughout Europe from the middle of the fifteenth to the middle of the sixteenth century. The visitors to our public libraries will notice large folio volumes, *centuries of observations*, the result of these unwearied labours. If unacquainted with the history of medicine he would probably exclaim, " Surely the writers of these books are the men to whom science is indebted;" but he would soon learn that their works did not advance knowledge, and that the writers have fallen into oblivion, while Sydenham, who wrote comparatively little, who has not detailed a single case at length, did more than them all for the furtherance of our art, and has earned to himself a name which will never be forgotten. We want the fruits of observation; mere cases are valuable only as proofs that the writer has not formed his opinions on insufficient grounds, or as illustrating some point of peculiar importance, or, lastly, as furnishing pictures of disease more graphic and more faithful than a person could draw from memory. M. Berton has given us cases in abundance; he has also given more than enough of the opinions of others; his own we are not unfrequently left to pick out here and there as we best can.

Cerebral affections are the first class of diseases which he notices. The opinions of different writers on the anatomical characters of hydrocephalus are passed in review by him. He refers to the frequent existence in this disease of softening of the central parts of the brain, and recognizes the inflammatory character of that variety which is marked by a rose tint of the cerebral substance. He hesitates as to the class to which the *ramolissement blanc* should be referred. The valuable researches of M. Durand Fardel, which go far towards establishing its intimate connexion with the *ramolissement rouge* and its inflammatory origin, were, if we mistake not, unpublished at the time of the appearance of his treatise.

Divisions of hydrocephalus into various stages, distinguished by peculiar conditions of the pulse or by other signs have been proposed from time to time, and some, as that of Whytt, have been extensively adopted. M. Berton points out, at p. 128, the little regularity in the alterations of the pulse on which Whytt founded his classification, while not unfrequently the threefold modification in the beat of the arteries does not occur at all. There is usually, in cases of hydrocephalus, a premonitory stage in which the symptoms of irritation are present, many of them indeed are common to other diseases, but some, as the headach, the regurgitation of food, and the vomiting without effort, are characteristic of this affection. A second period, in which these signs are more fully developed, succeeds, and is followed by one marked by the phenomena which indicate the near approach of death in all acute diseases, to which are superadded others dependent on the organic lesions of the brain. It is of importance, however, to bear in mind that hydrocephalus often runs its course without any full exhibition of its peculiar symptoms. No other signs appear than those which showed themselves at the beginning of the attack, till as life begins to fail, various signals of constitutional distress

announce the impending dissolution.   At other times no first stage is evident, the malady runs its course so rapidly, that it seems to have begun with the second stage.   But, besides this irregularity in the course of the disease, its symptoms are occasionally so little marked, that its nature might easily be altogether mistaken.

" We have sometimes met with no other symptom, even in children from four to five years old, than fever, vomiting, a sensation of heat about the supra-orbitar region appreciable to the hand ; low spirits, pettishness, and a kind of taciturnity, with somnolence, or constant desire to sleep.   In two cases of this kind which came under our notice last year, the continual vomiting might have led to the suspicion of some disease of the stomach, but its existence was disproved by a post-mortem examination."   (Berton, p. 129.)

Some valuable observations of this kind were related by M. Trousseau, in his clinical lectures, from which M. Berton quotes the following ;

" A child was admitted into the hospital, which seemed rather disinclined to move, but continued to suck, and had no convulsions until the day before it died, when its head was thrown somewhat back.   On a post-mortem examination we found a great number of tubercles in the pia mater, and softening of the superficial layer of the brain.   This child died of tubercular meningitis, but presented no sign of convulsions except slight throwing back of the head.

" A little girl seven years old, who lived at Paris, told her mother one day that she could see only half of a child who was at play a short distance from her : she had been struck with hemiplegia.   Some days afterwards she complained of being disturbed by the noise of the carriages in the street, and of the children at play ; she next showed her fondness for her parents in a manner which was not customary with her.   Vomiting, fever, and slight drowsiness followed.   A week afterwards the child fell into a sleep so deep that it was impossible to wake her ; the conjunctiva became injected, convulsions occurred, and she died.   Towards the close of the illness, the cerebral disease was very manifest, but at its commencement nothing could have excited suspicion of the nature of the affection.

" Another little girl, five years old, who lived with her parents in a house in the country, eleven leagues from Paris, complained of cold (it was in the month of June) and of weariness ; she returned home, went to bed, and fell asleep.   In the evening she was seized with a shivering fit, which recurred about the same hour on several successive days.   The medical practitioner of the place was sent for ; he took the case for one of intermittent fever, and gave the sulphate of quinine, but without benefit.   At the end of a week there was marked exhaustion, and the child made almost constant efforts to vomit.   The mother now became uneasy about her daughter, and having brought her to Paris we were sent for.   We found the little patient in such a state of stupor that she did not notice us.   M. Récamier was at once called to meet us in consultation, and, on account of the loaded condition of the tongue, he ordered an emetic of ipecacuanha.   On the following day the index finger of one hand was paralysed, on the day after there was paralysis of one eyelid.   Death took place after the lapse of some days, and, on examining the body, we found softening of the surface of the brain, and a little turbid serum in the ventricles."   (Berton, pp. 129-32.)

In our earlier practice we treated a fatal case of hydrocephalus, the exact nature of which was so marked by incessant and extreme vomiting, that we could not be persuaded of its real character until we saw the ventricles full of fluid after death.

Cerebral congestion is one of the most common diseases of infancy, but cerebral hemorrhage is an occurrence of extreme rarity.   M. Berton states (p. 217,) that during twenty years, M. Guersent has met with but

two instances of it, either in private practice or at the Hôpital des Enfans, and there are only nine observations of it on record. Insensibility, stertor, and paralysis of one side coming on suddenly, are its characteristic symptoms, while contractions of the limbs, and convulsive movements, are the usual indications of cerebral congestion. Distinct from hemorrhage into the substance of the brain, is hemorrhage into the cavity of the arachnoid, an occurrence by no means rare in the new-born infant, of which representations are given in M. Cruveilhier's Anatomie Pathologique. M. Serres has likewise described what he calls *apoplexie méningée*, which would appear to be a form of acute meningitis, terminating in hemorrhage on the surface of the brain; and this, too, is not an affection of great rarity. Since the publication of M. Berton's work, a paper on cerebral hemorrhage has appeared from the pen of M. Becquerel, (Clinique des Maladies des Enfans, 15 Avril, 1842,) in which a distinction is drawn between simple hemorrhage into the substance of the brain, and that which occurs as a complication of tubercular disease of the brain or pia mater. This latter form of hemorrhage is by no means so rare as the other; it usually takes place in the midst of the softened cerebral substance which is often found around tubercular deposits.

Selecting, as we proposed to do, such subjects only as seemed to present the greatest interest, we pass over several chapters, till we come to croup, of which both M. Barrier and M. Berton have treated. Both these gentlemen, but especially the former, appear not to have distinguished sufficiently between croup, such as is met with in this country, and diphthérite; M. Barrier, indeed, seems to regard the two diseases as identical. The diphthérite of the French writers is in all probability identical with the *garotillo* of the Spaniards, which formerly prevailed epidemically at various times, especially in the southern parts of Europe. The sore throat, the difficulty of swallowing, the great depression of strength, and the assumption of an epidemic character, are common to the two diseases. We find, however, in the older medical writers, notices of an affection of the air-passages quite different from the *garotillo* or *diphthérite*. In 1517 a catarrhal affection prevailed throughout Germany and the Netherlands, the symptoms of which closely resembled those of croup, while at the same time an epidemic raged at Basle, in which the tongue and fauces were white, as though coated with mildew; the patients were unable to eat or drink, and the local malady was associated with a pestilential fever, which proved extremely fatal. Again, in describing an affection of the throat, which prevailed epidemically at Alkmaar in 1557, Florestus (Lib. vi. Observ. I. & II.) expressly remarks, " At noster hic epidemius morbus, nihil commune cum angina habebat, licet in gutture per modum catarrhi populariter grassaretur." We have little doubt but that careful research would find among the older writers mention of two distinct affections, in one of which the pharynx was involved, while in the other the disease was exclusively confined to the air-passages. Another distinction between true croup and diphthérite is found in the circumstance, that though both may prevail epidemically, yet that epidemics of the former disease usually affect but a small number of persons, while epidemics of diphthérite are generally very extensive.*

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* In proof of this, see Eble, Versuch einer pragmatischen Geschichte der Arzneikunde, Band i. § 321—Wien, 1840; and M. Boudet's paper on Croup in the Archives Générales de Médecine for April, 1842.

The propriety or impropriety of performing tracheotomy in croup, is still a much-disputed question ; but the extensive trials which have been made of it by M. Trousseau, appear to be winning favour for it in France. M. Barrier states (p. 440,) that at the end of May, 1840, M. Trousseau had performed tracheotomy in 102 children affected with croup, of whom he saved 26, or one in four. This result is favorable to tracheotomy, since M. Guersent estimates the number of recoveries in cases treated without the operation at one in five. With reference to the time at which tracheotomy should be performed, M. Trousseau is decidedly in favour of its being resorted to at an early period, and of all his cases those did best in which no treatment whatever had preceded the operation.

M. Berton quotes from M. Gendron's thesis on Bronchotomy the following observations on the chances of success or failure of the operation under different circumstances :

" We are of opinion," says M. Gendron, " that practitioners frequently hesitate to perform this operation, owing to the slender chances of recovery which it often presents ; some of the circumstances which would warrant a person in practising it without hesitation may be worth mention.   Whenever the voice becomes stifled, the respiration hissing, when the patients make great muscular efforts in expiration, when the cough is seldom and suffocation imminent, and the face has lost its natural colour, it is probable that the approaching asphyxia results from some obstacle to the passage of the air in the larynx itself; and in such cases, opening the trachea reestablishes respiration, and permits the application of caustic to those surfaces which the diphthérite has reached. The operation still presents some chances of success when the cough, more frequent but loose, announces bronchial croup ; the looseness of the cough gives reason to hope that the flakes of false membrane will be speedily detached, and a twofold way is thus opened for their escape. If, on the contrary, the voice and respiration are dry and insonorous, if the voice had assumed the stifled character long before the first paroxysm of suffocation, if the inspiration has a blowing rather than a hissing sound, and the expiration is short, quick, and easy ; if, in spite of the hoarseness, the patient's articulation is distinct, and effected without any great effort of the muscles of the neck ; if the chest is largely dilated, the asphyxia is bronchial, the false membrane is adherent, tracheotomy would produce no change whatever in the respiration, and would not even have the advantage of retarding the patient's death."   (Berton, p. 320.)

There is another disease of the air-passages,—coryza,—not without danger to infants at the breast, though usually of no moment to such as are a few years old.   The principal danger arises from the formation of pseudo-membranous excretions, which were found by Billard, in five out of forty cases, lining the nares, and adhering very firmly to the membrane, which was of a bright red colour, thickened and friable.   In mild cases of the disease hardly any treatment is required, but in those where the head seems affected, a blister may be applied to the nape of the neck, or leeches may be employed if there should be any well-marked cerebral congestion.   If the disease is attended by the formation of a false membrane, insufflation of equal parts of powdered alum and sugar-candy is recommended by M. Berton (p. 356), or if it assumes a more chronic form, injections of various kinds may be thrown up the nostrils, or the surface of the nares may be touched with a solution of nitrate of silver.

In M. Berton's work is embodied a dissertation on tubercle of the bronchial glands, which gained for its author the medal of the *Société Médicale d'Emulation,* in 1830.   The reader will find much in it that is

of interest, but the field of inquiry to which it leads is too vast for us to enter on at the present time, besides which the essay is reprinted without alteration, as it appeared in the first edition of the work, and therefore does not contain anything absolutely new. The subject of tubercle and scrofula occupies the last 200 pages of M. Barrier's book. His remarks are characterized by sound sense, and the supposition which he advocates of there being certain scrofulous changes of organs quite independent of the presence of tuberculous matter, is one which many circumstances favour. We know no place where the whole subject of scrofula and tubercle could be better studied than at the Hôpital des Enfans, and for one good essay upon it, containing the results of careful investigation, and not written to develop one idea, or to serve some favorite theory, we would gladly barter, and we say it without intending to disparage the merits of M. Berton or M. Barrier, whole volumes of Practical Treatises on children's diseases, such as issue from the Paris press.

Art. IV.

1. *General Report on the Sanatory Condition of the Labouring Population of Great Britain.* By Edwin Chadwick, Esq.—*London*, 1842. 8vo, pp. 457. *Printed for Her Majesty's Stationery Office.*

2. *Local Reports on the Sanatory Condition of the Labouring Population of Great Britain, in consequence of an Inquiry directed to be made by the Poor Law Commissioners.* Two Vols. 8vo.—*London*, 1842. Vol. I.—*England and Wales*, pp. 444. Vol. II.—*Scotland*, pp. 334. *Printed for Her Majesty's Stationery Office.*

The readers of this Journal have, more than once, been called on by us to bestow their approbation and applause on the scientific labours of a gallant gentleman not of the medical profession—we refer to Major Tulloch—whose Reports on the Health of the Army would do honour to any physician, and must, indeed, be ever ranked among the most valuable documents in the department of statistical medicine. In the works before us we have the results of the labours of a lay civilian in the same general line of inquiry ; and we can bestow no higher praise upon them —nor, indeed, characterize them more justly—than by saying that the Sanatory Reports are worthy of being classed in the same high category as Major Tulloch's Army Reports. In the conception and origination of the inquiry, of which these reports are the fruits, Mr. Chadwick gave unequivocal proof of his being influenced by genuine philanthropy ; and in conducting it to its issue in the works now before us, he has shown a corresponding degree of industry and acuteness, and comprehensiveness of mental grasp.

It appears that in May 1838 the Poor Law Commissioners presented to Lord John Russell a report " relative to certain charges which have been disallowed by the auditors of unions in England and Wales;" together with two supplementary reports. One of these was by Dr. Arnott and Dr. Kay, on the prevalence of certain physical causes of fever in the metropolis, which might be removed by proper sanatory measures; the other, by Dr. Southwood Smith, was on the condition of the poor in Bethnal Green and Whitechapel, and exemplified some of the physical

causes of sickness and mortality to which the poor are peculiarly exposed. These reports were appended to the Fourth Annual Report of the Commissioners, being Appendix A, No. 1.

On the 29th April, 1839, the Commissioners received a Report from Dr. Smith on the prevalence of fever in twenty metropolitan unions or parishes during the year ending 20th March, 1838. This constituted No. 2 of Appendix C in the Fifth Annual Report of the Commissioners.

In August 1839 the Poor Law Commissioners received instructions from the Secretary of State for the Home Department to inquire to what extent the causes of diseases mentioned in the reports just named prevailed amongst the poor or labouring classes in England and Wales. They were thus constituted a board of health; not, however, for administration but for inquiry; and, consequently, in November following, the whole administrative machinery of the Commissioners throughout England and Wales was put in motion for the purposes specified. In January 1840 instructions were issued from the Home Office to the effect that the inquiry should be extended to Scotland. These extensive inquiries terminated in the presentation to Parliament, at the end of the last session, of the Reports we now propose to consider.

The General Report is a condensation of the local reports, together with a general report from the Commissioners, and we do not hesitate to say that it constitutes the most valuable and complete treatise on certain departments of medical police ever published, either in this or any other country.

The principles of medical police have been acted upon in England from a very early period; certainly 600 years ago. But, in fact, these principles may be traced in all societies of men, however primitive; the adoption of them may be termed an instinct. The common law against nuisances contains the kernel of our medical police, the term nuisance meaning anything by which the health or the personal safety, or the conveniences of the subject might be endangered. Thus it is contrary to law to divide a messuage in a town for poor people to inhabit, by which it will be more dangerous in time of infection. Mr. Chadwick says that the common law obligation upon all owners of property has, in general, been adhered to by the superior courts, " *Prohibetur ne quis faciet in suo quod nocere possit in alieno; et sic utere tuo ut alienum non lædas.*" The plain English of this is " do as you would be done by," a precept continually set at nought by the operation of the antagonist principle of selfishness—" every man for himself and God for all." Legislative enactments in great variety have been adopted to counteract this ever-operating desire to seek individual benefit at the cost of the public health and comfort. Such, however, has been the ignorance of all classes (not excepting the medical profession) of the leading principles of state medicine that these enactments have always been crude and insufficient, and generally useless. As medical science became more cultivated, hygiènic knowledge was more diffused, and we find an infinity of local acts and municipal bye-laws providing for the supply of water and the sewerage of towns; the cleansing of streets; the discovery and destruction of unwholesome food and drink, &c. Boards of health were established in Ireland, but have utterly failed in achieving any permanent good. The most important authority for removing nuisances was vested in the courts

leet.   Juries are empanelled at these courts and authorized to perambu-
late districts and judge of nuisances upon the view.   They have been dis-
continued in many parts of the country since the new Poor Law came into
operation, and it would be as well if they were discontinued altogether,
as in places where they are still held, the " annoyance juries" are com-
posed of petty tradesmen and mechanics, utterly ignorant, we need not
say, of the aim and scope of their duties, and of the knowledge neces-
sary to their proper discharge.   The mode in which a metropolitan " an-
noyance jury" proceeds is thus described by two respectable witnesses
who were unexpectedly called upon to serve.   We quote from Mr.
Chadwick's Report :

" When we were sworn in we went over the district ; we went through many
places which were disgustingly filthy, that I have since learned were places
where there is always fever, but we are not told about it ; the afflicted knew
nothing of our coming, and we had no medical officer or means to enable us to
detect the presence of any nuisances which would endanger the public health.
The number of persons sworn in was twenty-four, of whom I can remember six
were publicans, (at one or other of whose houses we dined on the days of meet-
ing,) one or two cheesemongers, three or four tailors or drapers, one builder,
and one bricklayer. .... None of the jury knew the nature of their du-
ties further than that they were to examine weights and measures ; that part of
their duty respecting the removal of nuisances, or of things affecting the health
or lives of the inhabitants of the district which we perambulated, was entirely
neglected or lost sight of."..........

The witness goes on to say, however, that condemnation was pro-
nounced on an old house, on the fiat of the builder and bricklayer.   The
utter inefficiency of these courts leet was clearly exhibited when the
cholera was epidemic.   The boards of health, we may observe, which
were then instituted to replace these courts were little less useless.

There is a self-regulating principle in the social and moral world, as
well as in the physical.   Ideas, if truthful, always end (sooner or later)
in action.   As science became diffused more minds were rendered ca-
pable of appreciating the warnings given from time to time by philan-
thropic physicians.   The seeds sown by these patient and unrewarded,
nay sometimes persecuted, well-doers, were not sown in vain.   And
although from a want of system it would be difficult to trace their effects
to the proper sources, these effects are exhibited in a diffusion through
this country of the principles and practice of public hygiène more exten-
sive and more efficient than is to be found in any other country.   For
several years scarcely a single session of the Imperial Parliament has ter-
minated without something being done for the public health.   Quaran-
tine, vaccination, the supply of water to towns, sewerage and drainage,
boards of health, the relief of lunatics and of the sick poor ; the state of
burial grounds ; the health of emigrant ships and of prisons ; the in-
spection of factories ; drunkenness ; medical education, and numerous
other minor heads of the general subject, might be mentioned in proof of
this statement.   All the proceedings of this kind instituted by Parliament
have been unconnected and clumsy.   In the system of moving for re-
turns and select committees there was simply nothing more than a cum-
brous improvement in the courts leet, and the members of the committee
were scarcely more acquainted with the principles of hygiène than the
" annoyance" jurymen.   In one thing, however, they were superior,

namely, in having the power in some degree to acquire knowledge from competent individuals. Yet when these individuals were heard as witnesses, the members of the committee were too often in the ridiculous position of persons utterly ignorant of a science sitting in judgment on the opinions of the learned and experienced ; appearing more ludicrous, indeed, to the initiated, than the whole tribe of justice Shallows.

This incapacity to conduct hygiènic inquiries with effect was accompanied by an utter want of unity of purpose and system. Reports were never acted on ; or worse, were considered mere collections of garbled evidence got together for a particular purpose, and not therefore to be relied on. The labours of one session were forgot by the next. A return made on the motion of a member was no sooner made than forgotten, or laid by as waste paper. An instance of this is before us. On the motion of Mr. Hume a return was made of the places of burial within the bills of mortality, belonging to each parish or precinct under the authority of the Bishop of London ; their locality, extent by actual admeasurement, and the number of burials in them in each of the years 1830, 1831, 1832, and in 1833 to 1st June. These particulars respecting 107 metropolitan burial grounds were obtained, with plans of several ; yet only nine years after, a select committee sits to inquire into the same subject, and reports, (we have reviewed the Report of this committee in our present Number,) without, apparently, being aware that such a document existed.

The government and legislature have, however, practically acknowledged that their previous plan was defective by the appointment of various commissions of inquiry, and subsequently of administration. Or it may be that the great accumulation of public business, the vast extent of the empire, and the multifarious duties incumbent on the legislature, especially on the House of Commons, compelled the adoption of such a course. However this may be, the poor-laws, public charities, and employment of children in factories and mines ; medical charities, the health of towns, and other matters connected with public hygiène, were investigated by these commissions with much improved results. Subsequently an improvement was even made on these commissions, for it being found that the objects of inquiry allotted to each commission were often cognate, the commissions were virtually consolidated by employing the same individuals on several commissions. This consolidation of duties is most systematic and obvious in Ireland, where the commission system has always been most rife ; but the Reports before us are a proof that it is gaining ground in England. The framers of the Act of Parliament which constituted the Poor Law Commission never contemplated that that commission should become a board of health.

The advantages of this system over the old one are obvious. The commissioners by devoting their whole time to their subject acquired both knowledge and experience. Besides some were qualified by previous education and habits for the performance of their duties ; as, for example, the physicians who constituted a part of the Factories' Inquiry Commission, or those who were appointed to inquire into the medical charities of Ireland. Yet examples are not wanting to prove the necessity of having individuals to perform these public duties thoroughly trained by education and practice. We will mention one of these, as both illus-

trating our meaning, and illustrating also other points connected with state medicine. In the second report of the Factories Inquiry Commission is a report from Mr. Tufnell. We know nothing more of that gentleman than what we have learnt from his contributions to the blue books of his commission ; it is, therefore, from his *res scriptæ* we infer that he is a warm advocate of large factories. As a proof of their superiority he observes :

" Mr. Ashton can afford to pay for all the surgical assistance that is required by his 1173 workmen, as he can contract for it at six guineas a year. Did he employ only a twelfth part of that number he assuredly could not get a surgeon to take the contract at a twelfth part of six guineas. Mr. Bott undertakes to attend to all the ailments of the operatives in Messrs. Lichfield's mills on payment of a half-penny each weekly ; he certainly would refuse to attend twenty persons for tenpence a week." (D. 2, p. 207.)

He certainly would do no such thing. Five minutes' calculation would have convinced Mr. Tufnell that these two cases were utterly dissimilar ; and having Dr. Mitchell's tables (to which we shall presently allude) before him when he penned that report, he ought to have calculated the real value of the " surgical attendance" contracted for by Mr. Ashton. If Mr. Ashton thought proper to deduct the sum of one halfpenny per week from the wages of his workpeople for surgical attendance he would get in one year the sum of £127 1s. 6d., and make a clear profit out of his unfortunate " surgical" drudge of £120 15s. 6d., that being the precise difference between the payment of Messrs. Lichfield's operatives to Mr. Bott and of Mr. Ashton to his surgeon. Stating the population of Manchester in round numbers at 400,000, the rate of payment for medical attendance adopted by Messrs. Lichfield's operatives would amount, on the whole population, to £43,330 per annum. So much for the analogy of the two cases. Let us now examine the work and labour done for six guineas per annum. In the supplementary report of the Factories' Inquiry Commission, Dr. Mitchell, the actuary, gives tables from which we can learn the number of attacks of sickness, and the duration of each attack, occurring to persons employed in cotton factories. We quote Mr. Macculloch's condensation of these tables :

Working in Cotton Factories, Lancashire.	Annual Attacks of Sickness, per cent.	Mean Duration of Attacks in Days.
Males, ages 11 to 31 . . .	. 27·8 .	. 16·43
Females, ages 11 to 31 . .	. 41·7 .	. 12·63
Average of both sexes . .	. 41·7 .	. 14·53

So that Mr. Ashton's 1173 workpeople would experience 407·61 attacks of sickness during the year, the average duration of each attack being 14·53 days ; and the unfortunate surgeon got nearly threepence halfpenny for each case ; or at the rate of six guineas for attending one person constantly sick for rather more than sixteen years. These calculations may appear incredible, but they are really favorable to Mr. Ashton. If his people had no better health than the *picked* labourers in the East India Company's service, the period last mentioned should have been stated at twenty-two years and a half ; or if their health be compared with that of the government labourers in the Chatham Dockyard, it should have been

estimated at more than twenty-seven years. Six guineas for twenty-seven years' attendance. Two ounces of Epsom salts per week, at one halfpenny per ounce, would for that period cost £5 17*s.* Perhaps we ought not to blame Mr. Tufnell for this slip in his report ; he has acted only like other people. The desire for medical knowledge and skill exhibited by government and public bodies has always been accompanied by a desire to get it for nothing—or less ; as in the case just analysed. What we wish to insist upon is, that if Mr. Tufnell had been regularly educated and trained for the performance of his duties, we need not have had to point out the fallacy of his facts, and the public would have been all the better served.

Having already expressed so favorable an opinion of Mr. Chadwick's Report, we may be permitted to observe that its great value does not consist in its containing anything wonderfully new either in principle or detail. The great importance and interest of the report arise from the authenticity and number of the facts. Some of these we shall notice, confining ourselves as much as possible to matters of practical value. It is quite impossible to condense the most general view of the facts contained in the report, so multifarious are they ; much less to consider some general principles of political economy which Mr. Chadwick propounds. Our silence therefore must not be construed into an assent to, or dissent from, those principles, or even into an unqualified acknowledgment of the truth of all the alleged facts derived from his correspondents.

The Report commences with a demonstration of the extent of the evils which were the subject of inquiry. This is attained by a tabular return made up from the registration of the causes of death in England and Wales during the year 1838.

" A conception may be formed of the aggregate effects of the several causes of mortality from the fact, that of the deaths caused during one year in England andWales, by epidemic, endemic, and contagious diseases, including fever, typhus and scarlatina, amounting to 56,461, the great proportion of which are proved to be preventible, it may be said that *the effect is as if the whole county of Westmoreland now containing* 56,469 *souls, or the whole county of Huntingdonshire, or any other equivalent district, were entirely depopulated annually, and were only occupied again by the growth of a new and feeble population* living under fears of a similiar visitation. The annual slaughter in England and Wales from preventible causes of typhus which attack persons in the vigour of life appears to be double in amount of what was suffered by the allied armies in the battle of Waterloo.   .
. . . But the number of persons who die is to be taken also as the indication of the much greater number of persons who fall sick, and who, although they escape, are subjected to the suffering and loss occasioned by the disease." (p. 3.)

The mortality in those attacked being 1 in 10, the numbers attacked are estimated at 250,000. The killed and wounded of smallpox are thus calculated :

" It appears that the extremes of mortality at the Smallpox Hospital in London amongst those attacked have been 15 per cent. and 42 per cent.   But if, according to other statements, the average mortality be taken at 1 in 5, or 20 per cent., the number of persons attacked in England and Wales during the year of the return must amount to upwards of 16,000 persons killed, and more than 80,000 subjected to the sufferings of disease." (p. 4.)

If we were inclined to be hypercritical we should find ample scope for practice in these, the first statements of the Report. It is plain the statement we have marked by italics is an exaggeration—though an uninten-

tional one. The deaths from epidemic diseases fall most extensively amongst children. In the year 1839, the deaths in Manchester from scarlatina, measles, hooping-cough and smallpox, were 1484; but only 132 of these were persons above five years of age, and only 16 above ten. Of 323 deaths from typhus, 101 were under fifteen years of age: so that there could not possibly be anything like the desolation Mr. Chadwick would have us suppose.

The general condition of the residences of the labouring classes where disease is found to be most prevalent is then exhibited. Reports from 11 cities and towns and from 17 districts, are laid under contribution. The extracts given by Mr. Chadwick deserve careful perusal. The close connexion between fever and the decomposing organic matter in open drains, sewers, privies, cesspools, &c., is clearly shown. The public arrangements external to the residences by which the sanatory condition of the labouring population is affected, are next reviewed under the several heads of town drainage; cleansing of houses, streets and roads; supplies of water, and land drainage. The details extracted from the voluminous reports are often curious. Some queer crotchety people have been the correspondents of the commissioners. The piety, patriotism, and profundity, of the provost of Inverness are only equalled by the niceness and naughtiness of his people. That gentleman writes:

"Inverness is a *nice* town, situated in a most beautiful country, and with every facility for cleanliness and comfort. The people are, generally speaking, a *nice* people, but their sufferance of nastiness is past endurance. Contagious fever is seldom or ever absent; but for many years it has seldom been rife in its pestiferous influence. The people owe this more to the kindness of Almighty God than to any means taken or observed for its prevention. There are very few houses in the town which can boast of either water-closet or privy, and only two or three public privies in the better part of the place exist for the great bulk of the inhabitants." (p. 43.)

In short, the people of Inverness are not very " nice," but a very social people, and worship Cloacina together under the wide canopy of heaven; in the streets as well as in the public penetralia.

Mr. Chadwick is a good tactician and makes a particularly happy hit when he demonstrates the great money-value of the refuse of towns. About 300 acres of poor land near Edinburgh, formerly dear at 40s. or 50s. per acre, have been irrigated during the present century by the contents of a large uncovered common sewer. This irrigation has so increased the value of the land that it lets for from £20 to £30 per acre. In 1826, £57 per acre was the rent of some of the richest meadows. As the sewer is a nuisance, attempts have been made to divert it. The parties interested have successfully resisted all these attempts, and estimate the value of the irrigation at £150,000. At this rate Mr. Chadwick makes the annual value of all the refuse of Edinburgh to be from £15,000 to £20,000. The value of the metropolitan refuse is nearly double the cost of all the water supplied to the metropolis. Science bids fair to make us all a sort of self-supporting mechanism; and to return our excretions in the shape of food as fast as they are eliminated: a consummation that will utterly rout the Malthusians, and make the human race eternal.

The whole of the observations in this section as well as the documents connected with it, in the appendix are important and interesting. Mr. Chadwick is quite at home when engaged with sewerage and drainage.

The " circumstances chiefly in the internal economy and bad venti-
lation of places of work; workmen's lodging-houses, dwellings, and the
domestic habits affecting the health of the lower classes," are next re-
viewed.   The working tailors seem to have more particularly attracted
Mr. Chadwick's compassionate attention, and not without reason.   We
have occasionally witnessed the journeyman tailors of the metropolis
at their work, and have always marvelled that they existed so long as they
do.   We are sorry we have not room for Mr. Brownlow's graphic de-
scription of the " tailoring" abominations.   Poor fellows are described as
fainting away, and tallow candles melting away from the excessive heat.
And then the varieties of stenches ! " It is not doubted," Mr. Chadwick
observes, " by medical witnesses that one third at least of the healthful
duration of adult life amongst milliners, dress-makers, and tailors, will
be found to have been destroyed by the ignorance of the want of ven-
tilation."

Mr. Chadwick undertakes to break a lance with Patissier about the
health of tailors, and Mr. journeyman-tailor Brownlow officiates as his
Sancho Panza.   Mr. Chadwick has neglected to separate the facts of
Patissier from his *à priori* inferences.   His facts refer to tailors as they
are, not as they might be, to diseased tailors, not to healthy; nor ought
a few isolated instances of young tailors making good sailors and soldiers,
and even grenadiers and dragoons, to be considered of much value.   We
would venture to assert that the young tailors so distinguished for their
strength and courage were originally much more skilful boxers or
poachers, than stitchers; and were oftener on their feet than their hams.

The effects of overcrowding of dwellings on the morals of the people,
and of noxious physical agents on the personal condition and moral
habits are well elucidated.   We cordially agree with Mr. Chadwick in
his opinions respecting the formation of drunken habits by the depressing
influence (on the nervous system) of foul air and injurious employments.
An irresistible craving for excitement is the leading effect of these in-
fluences.   The Report of the Parliamentary Committee on drunkenness
contains an exposition of Mr. Chadwick's views, repeated here.

Under the head " domestic mismanagement as a predisposing cause of
disease," Mr. Chadwick touches upon the terrible subject of fever, its
nature and origin.

" The medical controversy as to the causes of fever; as to whether it is caused
by filth and vitiated atmosphere, or whether the state of the atmosphere is a
predisposing cause to the reception of the fever, or the means of propagating that
disease, which has really some other superior, independent, or specific cause,
does not appear to be one that for practical purposes need be considered, ex-
cept that its effect is prejudicial in diverting attention from the practical means
of prevention." (p. 148.)

Without stopping to notice the want of precision in this sentence, or
to ask Mr. Chadwick how he can prevent a disease without preventing
its causes, and how he can prevent these without knowing them—we
would simply suggest that the word *smallpox* be substituted for the word
fever in the preceding passage; and read carefully over with this emen-
dation.   And the change is perfectly justifiable, so far, at least, as the
Glasgow fever is implicated; that being, as is well known, an exanthem,
resembling smallpox in the important circumstance that one attack affords
immunity from a second.   Mr. Chadwick apparently defines destitution

to be a want of food—*starvation*; and then denies that destitution is a general cause of fever or facilitates its spread. We are of opinion that destitution is sometimes a cause of fever, always a most powerful auxiliary to its spread; but by destitution we mean the deprivation both of food *and* of all other requisites to a healthy condition of the body. To be destitute is to be crowded into miserable apartments, to want fresh air, fuel, clothes, water, soap, and all the common comforts of life. Mr. Chadwick evidently lays much stress upon the general fact stated by Dr. Davidson, that only 17 per cent. of the fever patients admitted into the Glasgow hospital from May 1st to November 1st, were spare and unhealthy. This fact proves nothing more than that the unhealthy and thin had already had the fever, or were acclimated, and were not liable to infection. The whole of Mr. Chadwick's arguments looks too much like special pleading in favour of hygienic measures, endangered by the fever controversy between Drs. Arnott and Alison. Mr. Chadwick steps in as arbiter, but *tantas componere lites* is not so easy a matter. Both the reporter and controversialists have been equally unmindful of an important fact we noticed in our review of Dr. Motard's essay, and to which we have again referred in our present Number in the article on Interments. It is this, that by constantly living in a poisonous vitiated atmosphere, people in towns may acquire an absolute or relative immunity from its ill effects; just as Europeans in the West Indies or America may become habituated to the causes of fever, or in other words, acclimated. This general fact utterly demolishes Dr. Alison's arguments, and enables us to state *à priori* that the effects of uncleanliness in towns are felt most severely by the unacclimated emigrants. Statistics confirm these inferences. Dr. Cowan found that of 178 inmates of the Glasgow Royal Infirmary, in April 1840, only 38 were natives of Glasgow, and 98 had not passed the prime of life there. Dr. Perry states that not more than 15 per cent. of patients admitted into the Albion-street Hospital were natives, and 25 per cent. had not been three years resident. The deaths from typhus will be found to exhibit a similar ratio.

Table showing the comparative Viability of the Three great Classes of the Population in different Towns and Districts.

	Gentry and Professional Men.		Tradesmen.		Artisans, Operatives, Labourers,&c.	
	No. of Deaths.	Average Age of Deceased.	No. of Deaths.	Average Age of Deceased.	No. of Deaths.	Average Age of Deceased.
Rutlandshire	—	52	—	41	——	38
Wilts	119	50	218	48	2061	33
Derby	10	49	125	38	752	21
Bethnal Green	101	45	273	26	1258	16
Kendal	52	45	138	39	413	34
Whitechapel	37	45	387	27	1762	22
Kensington	331	44	348	29	1258	26
Leeds	79	44	824	27	3395	19
Strand	86	43	221	33	674	24
Truro	33	40	138	33	447	28
Manchester	137	35	1738	22	5597	15
Liverpool	—	38	—	20	——	17
Bolton	103	34	381	23	2232	18
Total	1088	43 nearly	4791	27⅔	19849	20½

We turn with pleasure from controversial matters to the interesting facts detailed by Mr. Chadwick in his inquiry into the " comparative changes of life in different classes of the community." The foregoing table is constructed from data in the Report. The average age of deceased is calculated on the deaths in the families generally of each class.

Thus the labouring population in Rutlandshire live (on the average) two and a half times longer than the labouring cellar-house population of Liverpool ; but the gentry of Rutlandshire live three and a half times longer. The abbreviation of life experienced by all the labouring classes, but most heavily by those of it resident in towns, is not an abbreviation necessarily dependent on their employments. It is not, however, among the labouring classes only where life is thus unnecessarily cut short ; the middle class suffers with them ; and even the higher, but in a less degree, as is shown by the tables. It is no exaggeration to assert that a good system of medical police would raise the average life of the labouring class to the average of the trading ; of the trading to that of the professional class ; and of the professional class in towns to the average of the same class in rural districts ; in short, that each might have life extended in duration one third at least beyond the present period. The influence of removable nuisances on the health of towns is admirably shown by two coloured maps. One is a map of Leeds by Mr. Baker, a surgeon in that town, and a gentleman who has brought much energy, industry, and intelligence to bear upon subjects connected with the public health ; the other is a map of Bethnal Green. Mr. Baker distinguishes the undrained and uncleaned portions by a brown tint deepening in shade as the filth deepens. This map is not novel in its plan, but is not the less interesting on that account. It will be seen by reference to it, that the tracks of cholera and fever are nearly parallel.

A table on the map exhibits the favorable effects of good drainage, wide streets, and ample house-room, on the rate of mortality. The following table made up by Mr. Farr will be equally convincing to those acquainted with the metropolis.

" Mean annual mortality of females in twelve metropolitan districts during the two years and a half ending 31st December, 1839.

Districts.	Annual Deaths.
	1 in
Hackney	57·87
St. George, Hanover Square	57·05
Camberwell	55·34
Islington	50·03
Rotherhithe	38·58
Clerkenwell	38·54
St. Luke	38·49
Greenwich	38·42
St. George, Southwark	33·77
East and West London	33·50
St. Giles and St. George	33·46
Whitechapel	28·15

(*Report*, p. 165.)

In our last Number we took occasion to place the principles of Malthus and Alison in antagonism, when noticing the " Principles of Population" of the latter. We stated that vice and misery were not checks on population ; that they were, in fact, encouragers of population.

The poor-law commission was instituted on Malthusian principles; it was the last great act to which that writer's ideas gave birth. Yet we have here the fable of Saturn reversed, and the poor-law commissioners, with Mr. Chadwick as their organ, advocating anti-malthusian doctrines. It will be seen from the following tables that vice, shortness of life and misery and a rapid increase of the population are co-existent, and *vice versa*. The township of Broughton, we would premise, is inhabited almost exclusively by the families of the higher class connected with Manchester. The township of Cheetham and Crumpsall is also inhabited for the most part by the upper classes who live in peculiarly good houses with a good natural drainage.

Localities.	Population.		Deaths.		Total Deaths of Males and Females.	Proportion of Births to Population.	Proportion of Illegitimate Births to Total Births.
	Males	Females	Males	Females			
			1 in	1 in	1 in	1 in	1 in
Broughton . . .	1554	2239	44·40	89·56	63·21	36·82	51·50
Cheetham & Crumpsall	3963	4862	45·03	63·14	53·48	34·74	50·80
Pendleton . . .	5109	5796	40·22	49·96	44·87	25·47	12 58
Chorlton-upon-Medlock	12551	15771	30·91	47·79	38·48	26·05	32·93
Hulme . . .	12850	13969	37·24	38·48	37·87	23·17	24·10
Ardwick . .	4586	5320	35·55	34·54	35·00	24·27	34·00
Salford . . .	24762	26760	27·30	36·60	31·42	22·83	21·90
Manchester . .	79061	84606	26·61	30·15	28·33	26·79	19·20
Total . . .	144436	159323	28·84	34·62	31·60	25·74	21·26

To make the proof of Mr. Alison's doctrines complete; and to exhibit the correctness of a principle we have before insisted on, namely, that a low physical condition is necessarily connected with a low moral condition, we subjoin the following Table exhibiting the comparative mortality of ten registration districts in Leeds; with the ratio of births and illegitimate births to the deaths.

Registration Districts.	Population.	Ratio of Deaths to the whole Population.	Ratio of Births to the whole Population.	Ratio of Illegitimate Births to Total Births.
		1 in	1 in	1 in
Chapeltown . .	4538	57·7	30·6	74·0
Whitkirk . . .	3194	56·0	29·0	36·7
Kirkstall . . .	17816	45·6	24·8	23·1
Rothwell . . .	5557	45·1	28·2	24·6
Wortley . . .	16185	44·4	24·9	26·0
Holbeck . . .	16668	41·9	25·4	24·3
Leeds, West . .	32286	40·4	28·4	19·2
Hunslet . . .	15784	35·5	24·2	21·7
Leeds, North . .	30465	30·9	23·9	14·3
East District (Kirkgate) .	24862	28·8	24·3	20·0
Total of Leeds .	167355	37·3	25·5	20·1

It is such undeniable facts as these which display the great and solemn duties incumbent on the medical profession. To give increase of years to the labouring classes is to diminish crime, and empty prisons; to improve the morals and increase the comforts of the people; leading them at the same time to a practical enjoyment of the religion so eminently

calculated to elevate the mind, and extend the enjoyments of the poor ; in short, to work a greater and more beneficial revolution in England, than ever it has passed through.

Mr. Alison argues that a high degree of civilization and social happiness is the best check in population.   This is proved in some degree by the experience of Geneva, deduced from the registries, commenced so early as the year 1549.   We cannot afford space for the interesting tables quoted by Mr. Chadwick : but we may state that the probabilities of life have gradually increased in Geneva from $8\frac{1}{2}$ years at the close of the sixteenth century, to more than five-fold, as follows : $8\frac{1}{2}$, $13\frac{1}{4}$, $27\frac{3}{4}$, $31\frac{1}{4}$, $40\frac{3}{4}$, 45, the latter being the present probability of life for each person born.   In 1836, with a large proportion of adults the births barely replaced the deaths.   Geneva having now attained a high degree of civilization and prosperity, the population is stationary.

Mr. Chadwick restates the statements made by writers respecting the physical deterioration of urban and manufacturing populations ; and which we referred to particularly in our last Number.   The race is deteriorated as the fecundity increases ; but as there is a constant influx of healthy emigrants, the noxious agencies operating upon such populations do not display their full effect.   We should infer, *à priori*, that if a cordon were drawn round the unhealthy districts of Manchester, so that this immigration were prevented, the inhabitants would, in time, be extinct ; would become less in stature and numbers, and die away.   The great extent to which this immigration takes place may be inferred from the fact stated by Mr. Chadwick, that in a late enumeration of the settled inhabitants of the labouring class in the lower parts of Westminster, it appeared that not more than one third of them were natives of London. The proportion is less in Glasgow.

Great fecundity in a population is not necessarily connected with great national strength.   That is best shown, as Mr. Chadwick very correctly remarks, by the increased proportion of the adults who are of the age and strength for productive industry.

" M. Mallet bears testimony that the experience of Geneva is confirmatory of the important rule, that the strength of a people does not depend on the absolute number of its population, but on the relative number of those who are of the age and strength for labour.   It is proved that the real and productive value of the population has there increased in a much greater proportion than the increase in the absolute number of the population.   The absolute number of the population has only doubled in the instance of Geneva, during three centuries ; but the value of the population has more than doubled upon the purely numerical increase of the population.   In other words, a 'population of 27,000, in which the probability of life is forty years for each individual, is more than twice as strong for the purposes of production as a population of 27,000, in which the probability or value of life is only twenty years for each individual." (p. 185.)

There are several tables exhibiting the weakness of our population in some districts when contemplated from this point of view as compared with the population of other districts.   We must refer the reader to the Report itself for these.   Mr. Chadwick states a circumstance, noticed repeatedly during the late riots, that whenever a crowd is collected in a physically-depressed district, the small proportion of aged or even of the middle-aged and the great preponderance of youth is very striking.   The

following passage offers much matter for deep thought to the legislator and political economist.

"On expostulating on other occasions with middle-aged and experienced workmen on the folly as well as the injustice of their trade-unions, by which the public peace was compromised by the violences of strike after strike, without regard to the experiences of the suffering from the continued failures of their exertions for objects, the attainment of which would have been most injurious to themselves, the workmen of the class remonstrated with, invariably disclaimed connexion with the proceedings, and showed that they abstained from attendance at the meetings. The common expression was, they would not attend to be borne down by 'mere boys,' who were furious and knew not what they were about. The predominance of a young and violent majority was general." (p. 201.)

In this paragraph Mr. Chadwick expresses a great principle. A generation is swept away before it attains by suffering to a mature personal knowledge of what is to its social or political advantage; and is succeeded by another generation equally ignorant and quite as inexperienced. So rapid is the movement that neither history nor tradition can put in a warning. A juvenile population must of course be ruled like school-boys; and a numerous police is now, in fact, their ushers. Turn-outs are "barring-outs;" and a riot is "the school in an uproar." It would be madness to give universal suffrage to such a population. Hygienic measures, by increasing the average duration of life in manufacturing districts, would increase the numbers of efficient adult labourers, and so diminish the demand for an immigrant population. There would thus be a reflux on the men-growing agricultural districts, and improved methods of cultivation or emigration must provide for the surplus. It cannot be doubted that agricultural labourers and mechanics are much better colonists than stunted hand-loom weavers and pale-faced cotton-spinners; and it is equally certain that more populous colonies would extend and strengthen our empire, multiply our shipping and sailors, enlarge our commerce and manufactures; and facilitate emigration in proportion as more extended emigration becomes necessary. There is congestion now in the manufacturing portions of the body politic—congestion amounting almost to inflammation; medical police operating in the way indicated, would restore the balance of the circulation, and bring back a healthy state of the system.

Under the head of "pecuniary burdens created by the neglect of sanatory measures," Mr. Chadwick gives some convincing proofs of the costliness of our present let-alone system. The support of widows and orphans alone is no small charge in the poor-rates. During the year ending Lady-day, 1840, no fewer than 112,000 orphans, and 43,000 widows received relief from this national fund. Mr. Chadwick enters into an elaborate inquiry, and infers from various statistical facts, that nearly 27,000 cases of premature widowhood, and more than 100,000 cases of orphanage may be ascribed to removeable causes. A variety of interesting details are given under this head of pecuniary loss, to which we cannot even allude. We give the Dundee fever-bill for seven years, as an example. It is drawn up by the Rev. G. Lewis from statistical data. In the seven years mentioned, there were 11,808 cases of fever in Dundee, and 1312 deaths.

"Fever bill of Dundee from 1833 to 1839.

	£	s.	d.
Loss of labour for six weeks of 5248 adults, at 8s. per week	12,595	0	0
Attendance, medicine at home or Infirmary, at £1 each	5,248	0	0
Loss of labour for six weeks of 5248 under age, at 4s. per week	6,297	12	0
Expense of treatment of the above at Infirmary or at home, at 10s. a piece	2,624	0	0
Loss by death of 656 adults at £150 each	98,400	0	0
Loss by 656 deaths under age at £75 a piece	49,200	0	0
Treatment of 1312 cases at £1 each	1,312	0	0
"Total expense for seven years	£175,676	12	0

"Or £25,026 13s. per annum." (p. 209.)

We next come to a vast variety of evidence of the effects of preventive measures in raising the standard of health and the chances of life. The costs of sickness and of prevention are compared, and some minute calculations are entered into which we fear some may consider as proving too much, and dismiss with one or other of those contemptuous monosyllables in which pithy people delight. The inability of workmen to improve their own condition, and the necessity of extrinsic aid for obtaining this improvement are satisfactorily exhibited. Here again Mr. Chadwick shows himself a sound-thinking anti-Malthusian. The employers' influence on the health of their workpeople is well shown, and proved to be exceedingly great. A very happy example of the modes in which it can be easily and successfully exercised is furnished by the mills at Catrine, in Ayrshire, under the superintendence of Mr. Archibald Buchanan. Mr. Chadwick discusses at length the materials and methods used in building cottages, and indicates those which are to be avoided and preferred. Several plans and drawings illustrate this portion of the text. The discussion respecting common lodging-houses (section viii.) might have been brought in here. An inquiry into the effects of public walks and gardens on the health and morals of the lower classes ends the section, and a plan of the *arboretum* at Derby, the patriotic gift of Mr. Strutt to his native town, is placed in the Appendix. A walk of two miles is contrived in eleven acres, and 1000 specimens of shrubs and plants are displayed.

The seventh section of the Report is occupied with a discussion of the recognized principles of legislation, and the state of the existing law for the protection of the public health. We are inclined to look on this as the best-considered section in the whole Report. Mr. Chadwick is quite at home amongst drains and sewers, as we have remarked before. A very good case is made out for legislative interference; and we anticipate the staunch support of the most intelligent and influential owners of property in favour of some such legislative measures as he proposes. We quote the following passage; firstly, because it contains truth, and, secondly, (and this is Mr. Chadwick's opinion,) because the truth is equally applicable to a system of medical police, as to a system of drainage and road-management :

"A competent, scientific, and efficient management, let it be applied to what part of these works it may, can scarcely fail to be immediately as well as ultimately the most economical management. .... Division of labour in

the arts derives its efficiency from combination, adaptation, and subordination to direction to one end." (p. 323.)

The concluding division of this section is an essay on boards of health and medical police.   It will be seen that Mr. Chadwick puts his literary charger to anything.   Engineering and doctoring might be called stiff fences for a barrister; but over them both our stout-hearted reporter vaults with perfect nonchalance.   It is a singular psychical phenomenon, that a member of the legal profession, after touching, of course, only the surface of the science of medicine, should be able to come forth as if his life had been devoted to the subject.   Mr. Chadwick, after grinding in the medical mill with Messrs. Kay, Arnott, Southwood Smith, and others for a while, appears here in a dress as professional as that of his instructors.   The inefficiency of boards of health and their failure in Ireland is stated.   The importance of the functions of medical officers in connexion with executive authority; the means and economy of skilled services for the prevention of disease; the administrative means for promoting the extension of medical science, and the necessity of attention to the prevention of disease are some of the questions discussed.   But Mr. Chadwick shall speak for himself on these subjects:

" The action of a board of health upon such evils as those in question must depend upon the arrangements for bringing under its notice the evils to be remedied.   A body of gentlemen sitting in a room will soon find themselves with few means of action, if there be no agency to bring the subject matters before them; and an inquiring agency to seek out the evils from house to house, wherever these evils may be found, to follow on the footsteps of the private practitioners, would be apparently attended with much practical difficulty." (p. 341.)

After giving evidence as to the loathsome condition of the lowest class of residences, Mr. Chadwick observes:

" It has only been under the strong pressure of professional duties by the physicians and paid medical and relieving officers, responsible for visiting the abodes of the persons reduced to destitution by disease, that the condition of those abodes in the metropolis have of late been known; and I believe that it is only under continued pressure and strong responsibilities and interests in prevention, that investigation will be carried into such places, and the extensive physical causes of disease be effectually eradicated.   Whilst experience gives little promise even of inquiries from such a body as boards of health without responsibilities, still less of any important results from the mere representations of such bodies separated from executive authority, I would submit for consideration what appears to me a more advantageous application of medical science, viz., by uniting it with boards having executive authority." (p. 343.)

Here, then, Mr. Chadwick fairly pledges himself to a plan of medical police.   The basis of this plan is the Poor Law Commission.   The 2300 union surgeons are to make the necessary hygiènic inquiries in connexion with the relieving officers.   These individuals are to be, in fact, perpetually perambulating " annoyance juries," while the boards of guardians will be constituted hebdomadal courts leet.   Some practical evidence of the probable working of the plan is given:

" From the consideration of such practical evidence, it will be seen that the ordinary duties of the relieving officer in the first instance, and of the medical officer afterwards, ensure domiciliary inspection of large districts to an extent and with a degree of certainty that could scarcely be ensured or expected of any

agents or members of a board of health unconnected with positive administrative duties. The inspection of these officers of the boards of guardians more than supplies the external inspection of inquests or of the leets; and it is submitted that in their position these boards may most beneficially exercise the functions of the leet in reclaiming the execution of the law, as against acts of omission and of commission, by which the poorest of the labouring classes are injured and the ratepayers burdened. It may therefore be submitted, as an eligible preliminary general arrangement, that it shall be required of the medical officer as an extra duty, for the due performance of which he should be fairly remunerated, that on visiting any person at that person's dwelling, on an order for medical relief, he shall, after having given such needful immediate relief as the case may require, examine, or cause to be examined, any such physical and removable causes as may have produced disease or acted as a predisposing cause to it; that he shall make out a particular statement of them, wherein he will specify any things that may be and are urgently required to be immediately removed. This statement should be given to the relieving officer, who should thereupon take measures for the removal of the nuisance at the expense of the owner of the tenement, unless he, upon notice which shall be given to him, forthwith proceed to direct their removal." (p. 348.)

Mr. Chadwick would not permit the delay of a day, if the medical officer should think delay dangerous, except in cases of appeal, or where a higher expense than £5, or a year's rent was involved.

" It is not unfrequent," Mr. Chadwick asserts, " to hear the expression of a wish from these officers, that some person unconnected with the district may be sent to examine the afflicted place and initiate the proper proceedings." This assertion " initiates" us into part the second of Mr. Chadwick's plan, namely, the appointment of *District Medical Officers*. These are to be for the special aid and supervision of the established medical relief, and for other duties. But Mr. Chadwick shall speak for himself :

" It will frequently be found that there is the like need of immediate local inspection of the medical treatment of the destitute, that there is of a grade of inspecting surgeons for the military hospitals. It cannot be otherwise than that amidst a numerous body of men there must be much error and neglect in the treatment of the destitute, in the absence of immediate securities against neglect. The most able of the guardians would confess that if they are not entirely incompetent to supervise medical service, they are at the best but imperfectly qualified for such a task, and the medical officers would act with more satisfaction to themselves from the supervision of officers from whom they might derive aid and confidence. But besides the medical treatment of the inmates of the workhouses and prisons, there are other cases within most districts which need the preventive service of a superior medical officer for the protection of the public health." (p. 350.)

We are not quite sure that we perfectly comprehend all that the last sentence is meant to imply. We suppose, however, that the district medical officers will inspect prisons (mentioned for the first time) as well as workhouses, and supervise the medical treatment of prisoners as well as of paupers. The " other cases" are

"First in the cases where the poorer classes are assembled in such numbers as to make the assemblage *quasi* public, and afford facilities for medical inspection, as in schools. Secondly, also in places of work and in workmen's lodging-houses. The occasional visits of a district officer for the prevention of disease would lead to the maintenance of due ventilation, and to the protection of the workpeople on such points as are already specified as injurious to the health,

and that arise simply from ignorance, and are not essential to the processes. An examination of such places, if only quarterly, would lead to the most beneficial results." (p. 350.)

Mr. Chadwick would intrust the duties of sub-inspector of factories to these district officers, and thus he thinks a sanatory supervision of the labouring classes would be secured :

" There would still remain, however, those of the labouring classes who do not work or lodge in large numbers, or work in a *quasi* public manner, to bring them within the means of convenient inspection. There would also remain without protection the cases of persons of the middle classes. To meet these cases I would suggest that the information brought to the superintendent-registrar as to the cause of death, imperfect and hearsay as it yet is, may serve as the most accurate index to the direction of the labours of a district officer appointed to *investigate the means of protecting the health of all classes*. . . . . For example, wherever, on the examination of these registries, deaths from fever or other epidemics were found to recur regularly, and in numbers closely clustered together, there will be found, on examination, to be some common and generally removable cause in active operation within the locality." (p. 352.)

The mortality of trades and the causes of that mortality could be investigated by the same means. We think this is a very happy hit of Mr. Chadwick's.   He justly adds :

" One of the most important services, therefore, of a superior medical officer of a district, would be to ensure the entries of the causes of death with the care proportioned to the important uses to be derived from them. The public should be taught to regard correct registration as being frequently of as much importance for the protection of the survivors as a post-mortem examination is often found to be." (p. 353.)

Mr. Chadwick next proceeds to argue, that a combination of medical services in one scientific individual, would secure both greater economy and efficiency. Of this there can be no doubt. Mr. Chadwick refers particularly to the medical service and inspection of prisons ; the inspection of lunatic asylums and of recruits; to union surgeons; to the granting of medical certificates ; to factory children ; and to medical evidence at coroner's inquests.   These and other services, it is observed, are divided in such portions as only to afford remuneration in such sums as £40, £50, £60, or £80 each; and many smaller and few larger amounts.   Mr. Chadwick observes that a fee of a guinea is given at each inquest for medical evidence.   This is certainly a mistake.   There are many inquests held without any medical evidence being demanded. Probably if the fees paid to medical witnesses at assize trials be included with the fees paid at inquests, the medical evidence in criminal cases may cost the country £12,000 or £15,000 per annum.   The medical attendance at the prisons, under the authority of the inspectors of prisons, cost, in the year 1838, the sum of £8890 15s.   We have made out the amount from the returns for that year.   The following is sound doctrine and well expressed ; and we think Mr. Chadwick feels the truth of what he writes ; let but the government act on such principles and the support of the profession is secured.

" Whatever may be yet required for placing the union medical officers on a completely satisfactory footing, the combination of the services of several parish doctors in the service of fewer union medical officers will be found to be advances in a beneficial direction.   The multiplication or the maintenance of such

fragmentitious professional services is injurious to the public and the profession. It is injurious to the profession by multiplying poor, ill-paid, and ill-conditioned professional men.   Although each may be highly paid in comparison with the service rendered, the portions of service do not suffice for the maintenance of an officer without the aid of private practice; they only suffice, therefore, to sustain needy competitors for practice in narrow fields.   Out of such competition the public derive no improvements in medical science, for science comes out of wide opportunities of knowledge and study which are inconsistent with the study to make interests, and the hunt for business in poor neighbourhoods..........The highest medical authorities would agree that, whatsoever administrative arrangements sustain narrow districts and narrow practice, sustain, at a great public expense, barriers against the extension of knowledge by which the public would benefit, and that any arrangements by which such districts or confined practice is newly created, will aggravate existing evils.   An examination of the state of medical practice divided amongst poor practitioners in the thinly-populated districts, shows that, but for the examinations, imperfect though they be, as arrangements which sustain skill and respectability, a large part of the population would be in the hands of ignorant bonesetters."   (p. 355.)

We will now briefly recapitulate what is comprised in Mr. Chadwick's plan of medical police.   As we understand it, it is intended to secure, 1, medical attendance on the sick poor and sick prisoners; 2, medical inspection of streets and houses and of the sewers, drains, privies, &c. appertaining to them; 3, medical supervision of union surgeons: 4, medical inspection of recruits and factory children; 5, medical inspection of prisons, workhouses, lunatic asylums, schools, manufactories, workshops, and other *quasi* public establishments; 6, the investigation of the causes of disease and the supervision of the mortuary registers; 7, the practice of forensic medicine so far as it involves the supplying of medical evidence at coroners' inquests.   Mr. Chadwick may possibly not purpose to accomplish all this; we are certain, however, that we have omitted no part.

Those of our readers who may have traced with us the extent of public hygiène as developed in one of our recent Numbers, will see that, as a beginning and fragment of a system, Mr. Chadwick's plan is exceedingly meritorious; as the outline of a complete system, it is exceedingly defective.   As, however, we hope on some future occasion, to discuss all the bearings of this most important subject at full length, we will here only guard ourselves against being supposed to subscribe to all Mr. Chadwick's plans as the best that could be contrived, while expressing our conviction that, if adopted exactly as proposed by him, they would be a boon of incalculable value to the public.

We think the consolidation of public medical offices is one of the best parts of the plan.   The opinions of Du Châtelet (quoted approvingly by Mr. Chadwick) respecting the qualifications of public medical officers are well-founded.

"It is generally thought in the world that the medical knowledge acquired in the schools is all that is necessary to become a useful member of the council. The greater part of medical men themselves share this opinion : and on the strength of some precepts which they have collected from books on health and professions, they think themselves sufficiently instructed to decide on the instant the gravest questions, which can only be resolved by special studies.   A man may have exhausted medical literature ; he may be an excellent practitioner at the sick-bed,

a learned physician, a clever and eloquent professor ; but all these acquirements,
taken in themselves, are nearly useless in a *conseil de salubrité* like that of Paris.
.... It requires habit and the frequenting of the places of work." (App.
p. 423.)

M. Du Châtelet insists, in fact, that a theoretical and practical know-
ledge of the subject is necessary ; and Mr. Chadwick adopts the same
views.   This principle should be kept steadily in view in establishing a
system of public hygiène.   Care should be taken, however, that a prac-
tical knowledge of disease be combined with this practical knowledge
of hygiene.   It is obvious that, if an officer of public health be de-
barred from private practice, he is shut out from the best—indeed the
only—field for the acquisition of the necessary practical knowledge both
of the diseases of the poor, and of the causes of disease removable by
hygiènic measures.   This practical knowledge of details would also be
the best guarantee for the judicious performance of the duties of the
higher grade, the district medical officer.   No officer, therefore, should
attain the higher grade except by service in the lower.

But our limits are reached, and we must here conclude without
noticing at all the local reports ; to these we hope to return at a future
period.   We cannot, however, close this article without once more ex-
pressing our approval of the talent, public-spirit, diligence, and enlarged
views of Mr. Chadwick.   Nothing but the enthusiasm of a high phi-
lanthropy could have prompted him to undertake the laborious task
which he has so admirably executed.   He will find his appropriate re-
ward in the consciousness of being the author of great good to his
fellow-men.

Art. V.

1. *Des Pertes Seminales Involontaires.*   Par M. LALLEMAND, Professeur
   à la Faculté de Médecine de Montpellier.   *Paris*, 1836, 1838, 1839,
   1841, 1842.   Trois Tomes.   8vo, pp. 681, 550, 533.
   On Involuntary Seminal Discharges.   By M. LALLEMAND, Professor of
   the Faculty of Medicine of Montpellier.—*Paris*, 1836, 1838, 1839,
   1841, 1842.   Three Volumes.

2. *Mémoire sur l'Emploi des Caustiques dans quelques Maladies de
   l'Urètre.*   Par le Dr. CIVIALE.—*Paris*, 1842.   8vo, pp. 59.
   Memoir on the Employment of Caustics in some diseases of the Urethra.
   By Dr. CIVIALE.—*Paris*, 1842.

3. *De Vesiculis Seminalibus Dissertatio.*   Auctore F. C. FAYE, M.D.
   Medicos cohortis in exercitu Norvagico.—*Christianiæ*, 1841.   12mo,
   pp. 233.
   A Dissertation on the Seminal Vesicles.   By Dr. FAYE, Regimental
   Surgeon in the Norwegian Army.—*Christiania*, 1841.

MOST practitioners of any experience, more particularly those whose
practice lies in large towns, not unfrequently meet with cases, for which
the following may serve as a general picture : The patients are of the
male sex, for the most part of early adult life; they are often pale in

the complexion, slightly emaciated, sometimes haggard and sickly in appearance : their manners are shy and nervous, and they often have a remarkable air of timidity, we might almost say, servility and abjectness. They are at once restless and listless, and do not exhibit that cordial interest in persons and things, which naturally characterizes those not labouring under positive and palpable disease, or not chilled by age into apathy and obtuseness of feeling. If they come under the professional observation of the physician, they are usually found by him to be extremely reserved as to the origin of the derangements, physical and moral, of which they complain : their statements are frequently confused and even contradictory; and very often the causes which they allege as having primarily induced their complaints are at once discerned by the practitioner to be not at all adequate to account for the various and anomalous symptoms which present themselves. A marked form of complaint with them usually is—the impairment of the interest which they were used to feel in life ; the disrelish of society, which has been stealing on them ; the gradual loss of memory and of the capacity for clear and vigorous thought, which they have observed : perhaps also they talk of derangement of their digestive organs, of vertigo, of " lightness" of the head, &c ; but they are in general (though not *always*) careful of approaching the real *fons et origo malorum ;* although their studied avoidance of it may not at all have blinded the acute eye of him for whose advice they apply.

Although we shall not deny that many or even all the morbid phenomena now enumerated may not be owing to other causes than masturbation or involuntary seminal emission, as for example, to certain peculiar and rare affections of the nervous system, yet, in many or most cases, they will, on examination, be found to be due, directly or indirectly, to the former, namely, to sexual abuses or derangements. The patient may or may not admit the accuracy of the physician's suspicions : and while his acknowledgment of vicious habits removes, of course, all doubt from the practitioner's mind, his denial must not be too implicitly relied on ; nor must induce the medical attendant to refrain from that line of treatment, nor from those warnings and suggestions, which his own observations and convictions incline him to adopt.

So far as the morbid phenomena which we have been describing depend simply on the practice of masturbation, it is plain that they may exist without any morbid condition of the genito-urinary passages ; and that, accordingly, all that is necessary to the removal of these phenomena, is the abandonment, by the patient, of the vicious practice giving rise to them.   No medical or surgical treatment is indicated or would be of any avail.   But the case is different in regard to *involuntary* seminal emissions, whether the patient be conscious of the occurrence of these, or whether, as is sometimes the case, they happen in what may be called an *insensible* manner, and one that leaves him more or less ignorant of their existence ; at least not cognizant of them, at the exact time that they take place.   Emissions of this description appear to depend, almost invariably, if not constantly, on morbid states, inflammatory or nervous, of the genito-urinary ducts or muscles.   We propose in this article to inquire into the nature and extent of these morbid conditions, and into the best modes of preventing or curing them.

The division of the subject which we propose is an exceedingly simple

one; but perfectly suited for all practical purposes. We shall first consider the affections of the genito-urinary passages themselves, which give rise to involuntary seminal discharges. We shall next consider the other causes—generally extrinsic, and for the most part of a mechanical character, or else operating sympathetically—by which such discharges are occasioned. We shall then offer some observations on the best modes of treatment, local and general; and may sum up, if our limits allow us, with remarks on various miscellaneous matters, which do not naturally come within the line of *practical* inquiry, which we have just chalked out for ourselves.

A state of chronic inflammation, or at least of irritation or erethism, of the mucous membrane of the urethra, particularly at the prostatic portion of that canal, appears to be by far the most general cause of involuntary seminal discharges. We may here observe that this chronically inflamed or excited state often extends to the mucous membrane of the neck of the bladder, and down into the ejaculatory ducts and seminal vesicles. The causes of this condition of the portions of the genito-urinary mucous membrane now described, may be very various. The most frequent is the irritation caused by either inordinate coition or by masturbation; by gonorrhœa or by simple blenorrhagy, by phimosis, &c. But however different in *themselves*, the causes now enumerated and others are, they all, as giving rise to involuntary emissions, concur in one mode of operation; that, namely, of producing the local morbid state referred to, of the mucous membrane of the urethra, more particularly at its prostatic portion.

Now, the effect of all chronic inflammation of mucous membranes is the production of a mixed state of irritability and debility. Thus we see nausea and frequently vomiting result from a chronically inflamed condition of the gastric mucous membrane: diarrhœa and the premature transmission of undigested aliment take place in a similar condition of the intestinal mucous membrane; in like manner as a frequent and fretful expulsion of the urine is the sequela of an inflamed state of the inner coat of the bladder. In these cases, according to well-known laws of nervous sympathy and relation, the nerves of motion are excited to action in consequence of impressions made on the nerves of sensation. And in these and in all similar cases of morbid change, it is remarkable that a *less* than the normal stimulus suffices to call the affected part or organ into its peculiar action. Thus the bladder empties itself, while yet not distended to that degree, which, when the organ is healthy, causes a desire in us to evacuate it. The stomach rejects aliment, which, in other circumstances, would be mild, agreeable, and rapidly digested. And the severest tenesmus occurs, while the bowel contains nothing to be expelled.

Precisely in the same pathological manner as the one now described does a condition of chronic irritation of the mucous membrane of the prostatic portion of the urethra, and of the ejaculatory ducts and of the seminal vesicles, give rise to involuntary discharges of semen. The parts concerned in ejaculation are thrown into action with preternatural facility. A less quantity of semen than in a healthy state suffices to excite energetic venereal desires, and to prompt to their normal gratification, provokes, in the debilitated and irritable state of the parts, contractions of

the seminal vesicles and expulsive efforts of the perineal muscles.   Nor do these emissions of the semen extend merely to occasional nocturnal pollutions, which, in the absence of coition and in a healthy subject, are often not to be considered morbid ; but they either degenerate into extremely frequent nocturnal discharges or even become diurnal ; that is, take place when the patient strains at stool or empties his bladder ; or when he takes the exercise of riding, or, in the worst cases, when he simply indulges in lascivious ideas.

We have said that involuntary seminal discharges depend *almost* constantly on a state of chronic irritation of the genito-urinary passages ; and we believe that we are so far borne out in saying so by the fact, that although in certain cases involuntary emissions take place, without any disease of the urethra and spermatic ducts, this is comparatively rare.   Yet it does occasionally happen.   Thus strangled persons sometimes emit semen involuntarily ; so do epileptics.   In certain affections of the cerebellum and of the spinal cord, a like result follows.   But our observation is, we believe, indisputable, that, in far the majority of cases, and perhaps even in those just enumerated, local irritation previously existing in the genito-urinary passages is necessary to give force to other less direct affections, such as piles, fissure of the rectum, dartrous eruptions of the perineum, so as to lead to involuntary seminal discharges.   We have not met with any case, where the spermatic passages were in a perfectly sound state, in which the indirect causes just mentioned sufficed to produce involuntary emissions.

It is not necessary to occupy the reader's time in pointing out in what manner excessive coition, and still less masturbation, give rise to chronic disease of the spermatic passages.   The mechanical irritation from without, the frequent and violent contraction of the ejaculatory ducts and vesiculæ, sufficiently account for the effect.   All organs discharging their contents on mucous membrane, and having that membrane ramifying in their cavities, are subject, if frequently stimulated, to suffer hyperemic tumefaction, both in their substance and in the mucous membrane internally lining them.   In other words, an organ too frequently called on to fulfil its peculiar function is apt to become hyper-vascular, and undergo either acute or chronic inflammation.   To this cause, as well as to mechanical irritation and too frequently exerted contraction, must be ascribed the generally turgescent and inflamed states of the spermatic passages, brought on by inordinate coition and by masturbation, and giving rise to involuntary emissions.

The manner in which blenorrhagic or gonorrhœal inflammation leads to involuntary discharges is sufficiently obvious.   The very cause on which these discharges depend, namely, irritation of the urethra and of the ejaculatory ducts, is here present and in emphatic operation.   And we have only to suppose the chronic continuance of the gonorrhœal or blenorrhagic inflammation, and the consequent induction of morbid sensibility in the mucous membrane of the urethra, ejaculatory ducts, and vesiculæ seminales, to have all the conditions on which involuntary emissions depend.

Phimosis, as a cause of these emissions, acts by producing chronic inflammation of the glans and internal surface of the prepuce, which is propagated up the urethral canal.   In phimosis there is usually a large

secretion of sebaceous matter between the glans and prepuce, which either from the neglect of cleanliness or the actual impossibility of thoroughly removing it, acquires acrid properties, and causes inflammation and sometimes excoriation of the glans and prepuce. These, long continuing, induce irritation and ultimately inflammation of the urethra, with occasionally involuntary seminal discharges.

Severe chronic eruptions on the prepuce, scrotum, and glans, sometimes give rise to involuntary discharges of semen. This more especially happens when, as occasionally takes place, the affection which commenced on the skin actually extends itself up into the urethra. (Lallemand, tom. i. p. 226.)

Before noticing the affections of the rectum, which occasionally bring on involuntary emissions, we may remark, first, that disease of the prostate gland itself, and, secondly, chronic affections of the mucous coat of the bladder, and vesical calculus, may give rise to involuntary seminal losses. Cases have occurred in which, as a sequela of a blenorrhagia or gonorrhœa, the prostate has become the seat of chronic disease; in the course of which the gland has suppurated; the mucous membrane through which its ducts open into the urethra has become ulcerated, and the small sphincters of the mouths of the ejaculatory ducts have been eroded and destroyed. Hence a species of seminal incontinence and a tendency in the vesiculæ seminales constantly to allow their contents to escape. It not unfrequently happens that the inflammatory action, beginning in the prostate and involving, as has been now stated, the mouths of the ejaculatory ducts, extends into the vesiculæ seminales themselves, giving rise to various serious lesions. Sometimes the orifices of the vesiculæ become tumefied, so as to preclude them for acting as receptacles or diverticula for redundant semen; which, accordingly, accumulating in the vasa deferentia and ejaculatory ducts, is ever apt to be expelled on the slightest action of the ejaculatory muscles. In other cases pus forms, and, not escaping, concretes in the vesicles, and equally, with the occlusion of their mouths just referred to, unfits them from serving as diverticula for the semen. Again, as a result of the inflammatory action, acute or chronic, of which they may be the seat, the vesiculæ seminales occasionally become collapsed or rather contracted to a great degree.

As regards those morbid states which *begin* in the bladder and thence are propagated along the mucous membrane to the prostatic portion of the urethra and into the spermatic passages, leading ultimately to involuntary escapes of semen, M. Lallemand has remarked one or two circumstances of interest. He observes that morbid irritability of the bladder is usually accompanied by a similar state of the spermatic passages, and that the morbid predispositions which characterize the one, usually characterize the other. Thus those children who in infancy are troubled with irritability of bladder, who are compelled frequently to make urine and who are apt to do so when asleep, are usually, some ten or fifteen years later, the subject of a precisely analogous irritability or susceptibility of the spermatic organs, leading to either very frequent nocturnal pollutions or else to involuntary diurnal discharges. If they suffer from blenorrhagia, (and to this affection the persons in question are prone,) or from gonorrhœa, involuntary emissions are apt to establish

themselves with a more than usual readiness.   They are also more diffi-
cult to remove in such individuals, and are also more liable to recur.

Calculus in the bladder operates as a cause of seminal emissions, both
by giving rise to chronic inflammation in the bladder and urethra, and
also by exciting irregular and spasmodic actions in the perineal and eja-
culatory muscles.

The affections of the anus and rectum which occasionally lead to invo-
luntary discharges of semen, are fissure of the anus, hemorrhoids, diar-
rhœa, and the presence of ascarides in the bowel.   It is obvious that
these causes may operate in one of two ways; either by producing such
a degree of irritation or inflammation as, after involving the anterior wall
of the rectum, extends to the vesiculæ seminales and the upper part of
the urethra, or else by inducing involuntary spasms in the perineal mus-
cles and the muscles of the penis.

Among other local affections giving rise *occasionally* to involuntary
emissions, may be enumerated hypospadias, hernia, varicocele. The effect
in the first of these affections must be greatly due to the congenital large-
ness of the urethra and also of the orifices of the ejaculatory ducts, which
almost always accompanies hypospadias; in the last two cases, the in-
voluntary emissions must usually result from reflex nervous action caused
by the rupture or varicosity, by which the muscles of the perineum and
penis are excited to sympathetic action.

Certain states of the cerebellum, not of organic change nor even of a
morbid nature, but consisting seemingly of a sort of physiological ere-
thism, appear occasionally to have *predisposed* to involuntary discharges,
and in other cases to the greatest and most immoderate *ardor copula-
tionis*.

Lastly, a peculiar, perhaps we might say an idiosyncratic, sensibility
of the nervous system in general, of that portion of the system distributed
to the genito-urinary mucous membranes and organs in particular, may
be the sole cause, at least the sole appreciable cause, of involuntary losses
of semen, whether by nocturnal or by diurnal emissions.

We shall now a little more particularly describe the symptoms caused
by involuntary seminal emissions, and in doing so we shall chiefly attend
to *diurnal* discharges.   Besides that nocturnal emissions cannot, in many
cases, be regarded as morbid, their effects are not so disastrous as diurnal
ones; while their diagnosis is easy, which is sometimes not the case with
the other sort.

The occasions on which diurnal emissions most frequently take place
are when the patient is at stool, and when he discharges his urine.   In
the former case the emission usually takes place at the moment that the
patient strains violently.   He may or he may not feel the passage of the
semen; he may or he may not feel voluptuous sensations, at the instant
of the accident occurring.   Generally the semen escapes at the time
that it is expelled from the seminal vesicles, and then the glans is found
to be bedewed with a glutinous fluid, while, if the alvine evacuation is
within reach of observation, a quantity of starch-like matter may often be
noticed on or mingled with that evacuation.   At other times or in other
cases the semen, though expelled by the *vesiculæ seminales*, is not imme-
diately emitted, but seems to remain for sometime in the urethra, from
which it escapes when the patient is perhaps readjusting his clothes.

When the involuntary emission occurs during, and is caused by, the act of evacuating the bladder, it is usually when the last drops of the urine are expelled, and when the perineal muscles and the ejaculatory muscles of the penis, are called into particular exercise, that the seminal discharge takes place.   In this, as in the other case, there may or there may not be slight voluptuous sensations.   Usually the patient is sensible of the urethra undergoing a greater distention at the moment the semen passes than it had done previously during the passage of the urine ; the sensation is as if something more bulky and more solid than the urine was passing along the urethra.   If his eye chances to be directed to the stream of urine, he observes it suddenly and towards the end of the discharge, assume an opaque white or albuminous aspect, which, of course, is caused by the semen.   This turbid state of the urine at the conclusion of the discharge cannot be confounded with opacity of the urine caused by vesical or urethral disease; because in the latter cases the turbid appearance of the urine occurs at the beginning and not at the end of that discharge.   When the neck of the bladder or the urethra is the seat of any morbid discharge that discharge is by a physical necessity washed down or out by the *first* gush of urine.   Or if the bladder generally is diseased then the whole stream of urine is turbid ; but that the earlier part of the urine should be clear and the last drops accompanied with an albumen-like matter, is diagnostic of diurnal emissions.

The appearance which the semen presents in the chamber-pot is next to be described ; and this is two-fold, namely, that of a starch-like liquor, occupying or constituting the lowest stratum of the contents of the vessel; or that of brilliant granules, like grains of the substance called semolina.   We presume that these last can be nothing else than those portions of semen which have become inspissitated in the little cellular recesses of the seminal vesicles ; and we are confirmed in this opinion by the fact, that when the emissions become very frequent, or after they have lasted long, the semen ceases to present the granular appearance, owing doubtless to its never being allowed to rest for any considerable time in the vesiculæ.   It becomes aqueous in a greater and greater degree, and its presence in the urine is indicated by merely a slight cloudiness in that liquor.   The granular appearances in the urine are distinguishable from those caused by salts by the fact of the former being visible in the urine as soon as it is voided, and not, as is the case with the latter, after it has cooled.

Before proceeding to notice with great brevity the functional and constitutional effects of involuntary seminal discharges, we shall first very shortly refer to the microscopic diagnosis of the semen ; and secondly inquire whether M. Lallemand's opinions of the frequency of involuntary and more particularly of diurnal emissions be well founded.

Microscopic examinations of the semen may be useful in some cases, as, for example, in medico-legal investigations connected with a demanded divorce on the score of impotency ; or in cases of royal or other important marriages, in which it is desired to ascertain whether progeny is or is not likely to be the result.   When we wish to ascertain whether the semen be of a procreative quality, a single drop of the liquid which remains in the urethra after sexual connexion is sufficient.   This being pressed out and placed on the object-glass, thousands of animalcules will, if the semen

be normal, appear after a shorter or longer time.   These in shape considerably resemble tadpoles, and move about with great vivacity.   In pathologic cases, the zoosperms are sometimes of great transparency, so that they do not become visible until a certain stage in the process of evaporation.   Sometimes the animalcules are in such numbers, that in order to observe satisfactorily the movements of particular ones, we must dilute the drop with water.   If the globule of fluid be kept from evaporation, and at the temperature of the body, the movements of the animalcules may be observed in it for many hours.*

Animalcules are never found in the blenorrhagic or gonorrhœal discharge; globules of various sizes and shape, shreds of epithelium and filaments which appear very large under the microscope, which are cylindrical, more or less transparent, and sometimes branched, are alone discernible.   These last consist of prostatic fluid, coagulated in the urethra; and to them, in affections of the prostate, is owing the turbid appearance of the *earlier* portion of the urine.

We are of opinion that M. Lallemand's notions as to the frequency of involuntary emissions are certainly exaggerated.   He would have us believe that in all cases in which there are neither coition, manustupration, or nocturnal emissions, there *must* be diurnal discharges, of which the patient may or may not be conscious.   Now, M. Lallemand seems to forget that the secretion of the testicles is a very different one from that of the liver or kidney, which last must *of necessity* be constantly going on and be constantly emitted.   The excretion of the kidney has relation solely to the well-being of the individual; that of the testicles is correlative, and has regard to a condition external to and independent of the male; and as this is a condition not always present, it is but reasonable to suppose that nature provides for such a contingency by regulating the testicular secretion according to the actual wants or opportunities of the individual.

The functional and constitutional symptoms of involuntary discharges are next to be considered.   The principal functional symptoms, or those which more immediately relate to the generative function itself, are more or less incapacity of erection, and consequently of impotence, or else a

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* We may here remark, in general, that from page 385 to page 431 of M. Lallemand's second volume, there are given numerous directions and cautions as to the management of microscopy of the semen; which those interested in such inquiries and proposing to institute them, will do well to consult.

We here give a representation of the human zoospermata in their living healthy condition, taken from Wagner's Physiology, so excellently translated by Dr. Willis. "Spermatozoa (magnified from nine hundred to one thousand diameters) taken from the vas deferens of a man shortly after death; *a*, spermatozoon presenting the flat surface; *b*, ditto, viewed in profile, the margin being presented; *c*, ditto, presenting the circular spot on the surface, which some suppose to be a sucker; *d*, a spermatozoon exhibiting a process from the anterior extremity of its body, not unlike a proboscis; *e*, seminal granules." (p. 8.)

greater or less approach to it; feeble or too brief erection; emission either too hasty or too tardy, not to mention an aqueous, non-animalculised, non-procreative state of the semen, which renders impregnation impossible, even when coition is occasionally duly effected.   To these may be added an unnatural absence of sexual desire.

Among the signs discoverable by surgical examination, are a great sensibility of the prostatic portion of the urethra, manifesting itself on the passage of a sound or bougie, which is often embraced spasmodically as it were by the urethra, and, if quitted for a moment by the hand of the operator, is jerked backwards and forwards in a singular manner.

As an occasional, though not a constant or an usually very striking symptom, is an irritability of the bladder corresponding to that of the vesiculæ seminales, and leading in the former to a morbid frequency of emptying the bladder, as in the latter to preternatural seminal discharges.

The constitutional symptoms of involuntary seminal discharges we have already, though very generally, adverted to, at the outset of this article. These symptoms are such as we might expect from a cause debilitating the nervous system generally, and not rarely mimic those of hypochondria.   They consist of very anomalous derangements of the digestive organs of the most puzzling character; flitting and inexplicable pains in all parts of the body, (often, according to our observation, at the epigastrium, right hypochonder, and in the cardiac region,) numbnesses at various points, &c.   We have also remarked on several occasions singular examples of loss of power in fingers, or in one of the upper or of the lower extremities, constituting a species of partial and temporary paralysis. Most of the patients of this description have complained to us of headach, which they usually describe as of a very peculiar kind; sometimes constrictive, sometimes expansive, or conveying the sensation of the brain being too large for the skull; sometimes as if there were a " burning" in the interior of the cranium.   Headach indeed appears to be one of the most common of the *constitutional* symptoms; since we find M. Lallemand saying that it was through patients who came to consult him for supposed organic head affections that he was led to the study of involuntary pollutions, of which head affections, these pollutions were the real though unsuspected cause.   And he gives one or two cases where death actually took place with all the symptoms of apoplectic effusion, but where, on examination, nothing adequately accounting for this catastrophe was discernible in the head, but the principal lesions were found in the spermatic and urinary organs.

Perhaps the *moral* symptoms of involuntary seminal emissions are fully as pronounced and as remarkable as the corporeal.   We have said that a poltroon air is a very characteristic trait; indeed, M. Lallemand describes it as almost pathognomonic.   This is, however, to overstate the matter.   An eccentricity of manner and ideas is not uncommon.   In his fifty-eighth case, M. Lallemand tells us:

" It is worthy of observation that the patient desired death, without, however, choosing to inflict it on himself, which is not rare in cases of this description; he exposed himself consequently to every storm, in the hope of being struck by lightning or of contracting some mortal disease; he traversed marshes, immersed to the breast in water, and retained his wet garments during the rest of the day; he would also have wished to have had a duel and to have died this

way; but his companions regarded him as *malade imaginaire,* or as a fool."
(Tom. i.)

Unsociality, suspicion, misanthropy, and we might also or rather say
misogyny, or pointed aversion to the female sex, are almost invariably
observed.   A continued desire of locomotion, either in walking or in
change of place and scene, is also a remarkable characteristic. From this
last peculiarity, among other presumed proofs, M. Lallemand is disposed
to regard Jean Jacques Rousseau as the permanent victim of involuntary
seminal losses.*   If so, the intellectual faculties in his case singularly es-
caped that impairment which usually accompanies the moral perversions
just described; since, while those of the citizen of Geneva were always
subtle and sometimes masterly in their manifestations, in most cases
of this kind, they are confused, languid, feeble, indicating an incipient
degree of hebetude or fatuity.   The memory is usually remarkably
impaired.

We now come to consider what is the best treatment of those involun-
tary seminal emissions, of the causes and symptoms of which we have
been discoursing.   We dismiss from our view nocturnal emissions, oc-
curring with moderate frequency and when coition is abstained from, since
such emissions, especially in young and robust men, cannot be considered
morbid, nor are attended with hurtful consequences.   The following ob-
servations on treatment are accordingly to be understood as applying to
diurnal emissions, though they are likewise entirely pertinent to nocturnal
discharges of very frequent recurrence.

The treatment is, like the symptoms, divisible into topical and consti-
tutional, in discussing which we shall follow the same easy and natural
method which we have endeavoured to do in the former part of this
paper.

M. Lallemand's account of the circumstances which indicate the em-
ployment of cauterization of the prostatic portion of the urethra, (which
as *one* of the modes of treating seminal emissions, we shall in due course
consider,) may be quoted here, as giving a concise view both of the par-
ticular states to be treated and of the difficulties of treating these states:

" In cases of involuntary pollutions," he observes, " there exists almost always,
at the same time, irritation and debility, excessive sensibility, and want of tone
in the spermatic organs. . . . . In almost all cases of diurnal pollutions,
these two conditions may be observed to be present simultaneously, but in va-
riable proportions; this precisely it is which disconcerts the practitioner and
causes despair in the patient; since antiphlogistics and tonics, emollients and ex-
citants, repose and fatigue, produce good or bad effects in the same individual,
according as the irritation or the debility predominates at the moment." (Tom. i.
p. 193.)

As cauterization, for involuntary seminal emissions depending simply
on chronic irritation and inflammation, of the prostatic portion of the
urethra and of the vesiculæ seminales is, or is alleged to be, the most effi-
cient method of treatment, we may perhaps with propriety commence
our observations with a consideration of its merits.   And we shall begin
with quoting M. Lallemand's explanation of its *modus operandi* in such
cases:

* M. Lallemand seems to forget that Rousseau sent four or five children to L'Hospice
des Enfans Trouvés.

" Cauterization," he observes, "has the advantage of combating at the same time these two orders of symptoms [debility and irritability]; by destroying the surface of the engorged tissues, it alters their morbid sensibility; the resolution of this state produces a contraction of the parts, which gives them new energy; hence it is that cauterization in the most of cases suffices to bring about a cure." (Tome i. p. 193.)

Without entering into an abstract discussion or inquiry in what peculiar manner it is, that nitrate of silver acts in restoring the normal sensibility and normal action to morbid surfaces, we may observe that the action of this agent in superseding or modifying what we may style the *natural* inflammation by its own artificially induced one; in taking down vascular tumefaction or morbid growth; in giving tone; in lessening irritability and sensibility, is now as well understood and as entirely established, as that of any surgical means whatever. Some of its beneficial action may doubtless be due simply to its destroying superincumbent morbid layers or parts, thereby giving nature an opportunity of replacing them by healthy ones; but much must also be attributed to its vital stimulation of the nerves and vessels. As we do not see that any useful end would be served, by discussing now and at greater length the *theory* of the action of nitrate of silver, we dismiss this part of the subject with the remarks just made.

As we believe it will be interesting and acceptable to our readers to know what has been the *actual* experience of *British* surgeons in this mode of treating involuntary seminal discharges, and as we have been put in possession, by private communications from some of the most eminent surgeons of this country, of the means of supplying our readers with such information, we shall proceed to transcribe extracts from some of the notes now lying before us; and having done this, and then given a short summary of the success of cauterization in M. Lallemand's own hands, together with an account of the manner of performing the operation, we shall afterwards consider *other* methods of treating involuntary emissions of semen. We must first, however, observe, possibly to the surprise of M. Lallemand, that in cases similar to, if not identical with, those in which he advises it, the armed bougie was applied to the urethra more than forty years ago by a British surgeon. This was pointed out to us by Mr. Curling. In one respect, the operation of Sir Everard Home differs from that of M. Lallemand, in so far as the former adopted cauterization for, and in employing it, believed himself to be treating, a " spasmodic stricture," although it is plain, from his own narrative of his cases, (the first of which we shall quote,) that no real stricture existed, but simply that irritable and morbidly sensible state of the prostatic portion of the urethra, which characterizes most or all of those cases for which M. Lallemand himself employs and recommends cauterization, and which renders the passage of the bougie at once painful and difficult.

" A gentleman who had early addicted himself to that pernicious vice (masturbation), had the following symptoms brought on at the age of twenty-one: frequent emissions in sleep, attended with great lassitude, depression of spirits, and loss of general strength, headach, inability to apply his mind to business, or exert himself for the whole day after such an event had taken place. These occasionally happened for several nights in succession, and then left him for six or seven, but that was the longest interval. The effects of these attacks upon his *reasoning faculties* was such as to make him completely miserable. I explained to him that I thought it probable that the symptoms of which he

complained arose from a spasmodic stricture immediately behind the bulb of the urethra, brought on by the practices to which he confessed he had been addicted, and upon passing a bougie this proved to be really the case. As the urethra, although in an irritable state, admitted with some little difficulty a tolerably sized bougie to pass into the bladder, I thought the use of a common bougie might be sufficient to relax that part of the urethra, and by being frequently applied, might take off the preternatural sensibility. This, however, upon trial was found not to be the case, and little advantage was gained by its use. It was therefore found necessary to have recourse to the caustic, and six or seven applications of the armed bougie had the power to take off the sensibility of the urethra, as well as to remove the spasmodic contraction; and the tendency to emissions, with all their enervating effects, was very much relieved." (Practical Observations on the Treatment of Strictures of the Urethra, and of the Œsophagus. Edition 1803, Vol. ii. p. 247.)

The other case was one of *diurnal* emissions, in which "the moment his (the patient's) passions were excited, an effect very readily produced, emission took place, even before there was a complete erection," and there was also "a total inability to have connexion with women." Masturbation, in this as in the former case, was the inducing cause. The armed bougie was applied four times, but the amendment was only very partial. (Op. cit. p. 249.) One gentleman writes us:

"I can recollect eleven cases in which I have found Lallemand's treatment successful, and one in which it did not completely succeed. In seven of the eleven cases a single application of the caustic was enough, in four it was necessary to apply it a second time; in a single case two applications were insufficient to cure the disease, although the improvement was very great. .... The effects are immediate. A person in whom the discharge has continued for months, will have none for some days after the use of the caustic; but in some cases, as the irritation subsides, it will come again.

"I have carefully noted," writes another gentleman, "*twenty-seven* cases treated by the nitrate of silver, either applied in the solid form to the prostatic portion of the urethra, or used in the form of injection. Of these cases, thirteen were completely cured; eight so much benefited that the emissions only returned occasionally and produced but little effect on the system; and the remaining five benefited by the period between the emissions being lengthened, though not to the same extent as the cases in the second series. The application of the solid nitrate, in many cases, produces very great irritation, sometimes complete retention of urine for a short period; in others, inflammatory irritation with bloody urine, lasting from eight to ten days and even longer. These circumstances lead me to use solutions of the salt, one or two grains to the ounce, advising the patient to inject several times at intervals of three and four hours, till a marked irritation was brought on; then to discontinue the remedy for a time and to have recourse to it again if the cure was not effected, when the irritation has subsided. The injections used in this way produce often great irritation and bloody urine, which continues sometimes many days. They have, however, in almost every instance, a beneficial effect upon the emissions."

A well-known and experienced Scottish surgeon observes:

"With regard to Lallemand's method of cauterizing the urethra, I have tried it in above a dozen cases, and in the majority of them with decidedly good effects. In those distressing cases of irritability of the bladder, where the prostatic portion of the urethra is chiefly affected; in certain cases of chronic disease of the mucous membrane of the bladder, and in that very prevalent and debilitating complaint to which young men are subject, nocturnal emissions, the efficacy of the practice is sometimes very striking. In the latter case, when the cauterization of the prostatic portion of the urethra fails, I have been lately in the habit, from a knowledge of the very intimate sympathy subsisting between

the parts, of applying the cautery to the external orifice of the canal, and for about an inch down, and I think, in some cases, with more decided advantage."

The last communication we shall quote is the following :

"I have employed the caustic in several cases in private and at the hospital, and I entertain a very favorable opinion of its efficacy: indeed, in some instances, its good effects have been quite remarkable. I have used it successfully in cases of seminal emissions from self-abuse, sexual excesses, or in cases of obstinate onanism, which affections appear to be attended with, and partly kept up by, a morbid state of the prostatic part of the urethra. After using the caustic, I have found benefit from small doses of cubeb powder (gr. x.—xxx.) combined with the tincture of hyoscyamus, and also from steel medicines; the patient practising, of course, the most rigid self-denial in respect to the cause of the complaint. The patients upon whom I have employed the caustic, have not experienced the severe effects described by Lallemand as 'occasionally' resulting from it. The application which I make is always slight and transient, and the effects of it subside in a day or two. I have never had occasion to apply leeches to the perineum afterward, and in no case has swelling of the testicles been produced by it. The hip-bath and rest is all the treatment usually required : but I am generally obliged to make two or three applications of the nitrate of silver, and sometimes more before the complaint is wholly removed."

In regard to caustic injections as practised by the gentlemen whose notes we have quoted second and third, we have ourselves had no experience in *this* complaint, though of course, in common with every practitioner, we have times without number ordered them in gonorrheal and blenorrhagic discharges. We are disposed to think that the former of these two gentlemen considerably overstates the effects of cauterization as they usually manifest themselves, and we are also disposed to believe that the application of the solid caustic to the deep part of the urethra is less irritating and more effectual than the application of it in solution and to the outer part of the urethra.

We had intended to quote some of M. Lallemand's cases : but as the details given in the communications of the gentleman which we have just transcribed, are complete, we content ourselves with stating that the reports of the Professor of Montpellier, making every allowance for the perhaps excusable partiality of their author, leave no doubt as to the useful effects of the operation of cauterization in properly selected cases and when prudently applied.

The space which M. Lallemand usually cauterizes, is from the neck of the bladder to the membranous part of the urethra ; but sometimes he brushes over the internal surface of the bladder itself to a greater or less extent. He cautions us strongly against repeating the operation too soon ; and advises us to wait two or three weeks before we re-apply the caustic. Many of his cases appear to have been cured by a single application. Pain, and a slight discharge of blood, but never amounting to hemorrhage, seems to have followed some of his operations ; but these consequences disappeared at the end of from twelve to forty-eight hours. In one case they are described as lasting three weeks, but this is mentioned as a rare exception. When the emissions have been *diurnal*, M. Lallemand regards the conversion of them into *nocturnal*, and the fact of the emissions being once more accompanied with erections and

with pleasurable sensations, as a sign of the favorable effects of treatment and prospect of cure.

Of the mode of performing that operation, and of the instrument for doing so, it is singular that all mention should have been omitted in the works of Lallemand which head this article.   This somewhat unaccountable neglect, we must supply by the aid of Mr. Curling ; whose paper, which we are about to quote from, well merits perusal.

"M. Lallemand's instrument, [which may be had of Mr. Weiss,] consists of a straight or curved platina canula or tube, rather smaller than a middle-sized catheter, through which plays a caustic holder ; in the further extremity of which there is a narrow groove, eleven lines in length, for the purpose of holding the caustic.   After filling the groove with the nitrate of silver, by fusing it over a spirit lamp, it becomes so securely fixed, that there is no longer any danger of its escaping.   At the other end there is a sliding screw or stop, by which the action of the remedy may be limited to any extent less than the length of the groove which contains it.   Another sliding stop affixed to the canula serves, after the distance of the meatus from the part to be cauterized has been ascertained, to prevent the instrument passing further into the canal." (Med. Gaz. Jan. 19, 1839.)

We may likewise quote the same gentleman's method of employing the instrument :

"I first pass," he says, "a wax bougie down to the stricture, in order to ascertain its distance from the meatus, which I mark with my finger-nail.   I then regulate the caustic holder according to the extent of the urethra that I wish to touch, and having closed the instrument so as to conceal the caustic, I fix the sliding stop on the canula, at the exact distance from the extremity corresponding with the mark on the bougie.   Having introduced the instrument thus prepared as far as the stricture, I push forward the caustic holder, and after rapidly making one complete turn, I instantly close the instrument and then withdraw it.   It will be readily perceived that the great advantage of this instrument consists in its enabling the surgeon to limit the action of the caustic to the part diseased, and to as small an extent as he pleases.   Thus, by rotating the caustic holder, the lunar stone may be applied to the whole circumference, to one side or to some particular part of the canal, while its action may be extended to any part within reach of the instrument." (Med. Gaz. Jan. 19, 1839.)

We shall now, with great brevity, advert to other modes than cauterization of treating involuntary seminal discharges, depending *solely* on chronic inflammation of the prostatic portion of the urethra and of the vesiculæ seminales.   The daily introduction of a bougie, and the retaining it for a longer or shorter time in the urethra, may first be mentioned. This, as our own observation enables us to testify, is often useful. Leeching of and blisters to the perineum are means of no slight efficacy, especially where the prostate is tender and enlarged.   We have also prescribed tartar-emetic frictions of the perineum with excellent effects. A total abandonment of masturbation and a moderate use, or even an entire though temporary disuse of coition, are, of course, indispensable measures.   One of our correspondents states that he has found opiates extremely useful.   They are so in most cases though not in all ; since they sometimes seem to augment the disease.   Conium is safer : and both it and opium may be used both constitutionally and as a suppository. Cold clysters are often of benefit.   As regards general means, alcoholic and malt liquors must be abandoned.   M. Lallemand's opinion of these is exceedingly hostile ; and we believe he is right in this.   The food should be nourishing, light, and unstimulant ; the bowels should be of

course attended to, and, as a general rule, country air and exercise pre-scribed. Among medicines and articles of diet, tea and coffee in excess, tobacco, camphor, nitrate of potass, aloes, must be abstained from.

We shall notice, with equal brevity, the modes of treating emissions dependent on other causes besides chronic irritation of the prostatic portion of the urethra. Phimosis requires circumcision ; fissure of the rectum, section of the sphincter ; dartrous affections, the use, internal and external, of sulphureous waters. If the bladder be the seat of chronic inflammation, which thence propagates itself into the urethra, thus causing emissions, that viscus may be cauterized. This is an operation not rarely performed by M. Lallemand, and with safety and success. If involuntary pollutions be caused or kept up by piles or ascarides, we need scarcely say that the appropriate means for the removal of these, must be had recourse to ; nor is it necessary for us to indicate what these are. The same remark applies to hernia, varicocele, &c.

Lesions, organic or functional, of the spine and cerebellum require lines of treatment which it would, of course, be out of the question to enter on here : but we would make one general observation. Often, in cases in which the involuntary emissions have *originally* been solely or chiefly due to some cause extrinsic to sexual abuse, and other than chronic irritation of the prostatic portion of the urethra, these emissions do not cease immediately on the primary cause, whether phimosis, fissure of the rectum, ascarides, &c. being removed ; but still continue, owing either to the ejaculatory muscles having acquired a *morbid habit* of contracting themselves, or else to chronic irritation having been set up in the urethra, and having survived the cause that originally produced it. In such cases, cauterization or some of the other means already indicated, must be had recourse to.

In many of M. Lallemand's cases, virility where there had been im-potence followed marvellously soon after the operation of cauterization. But we must caution our readers against what we must view as some-what unguarded representations of M. Lallemand on this head, and warn them that vigour of the generative organs, after a period of abuse, inaction, or disease, is not so readily nor so easily recovered.

On the subject of *Masturbation*, M. Lallemand gives a large amount of details, many of which are scarcely fitted to appear in an English dress, even although in the pages of a professional review.

In boys, this baneful habit is often excited by the practice of pulling forward the prepuce to relieve the irritation of stone or gravel. It is also sometimes involuntarily suggested to them by the habit of sleeping on their bellies, by which their genital parts are heated and pressed upon. Nurses should be made aware of this. It is astonishing at what an early age children may be initiated into this habit ; M. Lallemand quotes a case of a child of eighteen months having been taught it by an abandoned nurse.

The prophylaxis which M. Lallemand proposes for self-abuse merits some attention. According to him, the first and surest means of curbing the tendency to it, whether in infants or adults, is *muscular exercise pushed to fatigue.* Our own observation leads us to the same conclusion : still, speaking philosophically, it must be admitted to be but a very im-perfect and equivocal mode of meeting the difficulty. For, how can

there be prophylaxis against the sexual appetite (this after all being the real question,) any effectual means other than the one pointed out and provided by nature, of satisfying a natural appetite? The answer is obvious.

We admit, indeed, that exercise is most important, muscular exercise being the natural antagonist of a too irritable and excitable nervous system; but, while we assent to M. Lallemand's proposal as the best, perhaps, of the two evils, while we willingly recommend its adoption in lieu of a better; we at the same time perceive that it is but a clumsy and inadequate substitute for the natural means. M. Lallemand himself, indeed, seems to be fully aware of this truth, since he concludes this part of his subject with the following remark :

"As to conciliating" [the gratification of] "these irresistible desires with the not less imperious requirements of society, I own that the difficulties are grave and manifold; but it is not by a system of inflexible rigour, that we shall arrive at a solution of the difficulty. It is necessary, that, sooner or later, laws and manners should accommodate themselves to the organization of man, by endeavouring to obtain from it the greatest possible advantage, to the interest at once of the individual and of the species." (Tom. ii. p. 264.)

In addition to muscular exercise as a preventive M. Lallemand suggests that the studies of young persons should be much more diversified, and should be rendered much more *engaging* than they at present are; that all the intellectual faculties, those that respect the fine arts, as well as those that respect science, should be actively and pleasingly occupied, in order that the attention and the thoughts of youth should be diverted from those more dangerous reflections and musings, incident to opening life, and which, in the author's opinion, the dry and harsh nature of scholastic study is so apt to favour.

We have left ourselves but little space to express the favorable opinion we entertain of Dr. Faye's small yet complete and perspicuous treatise. The following subjects are clearly but concisely and ably handled : the anatomy, physiology, pathological anatomy of the vesiculæ seminales; then the diseases or accidents to which these are liable, namely, inflammation, suppuration, induration, scirrhous degeneration, tuberculosis and scrophulosis, hemorrhagy, varicosity, calculus, fistula, atrophy, hypertrophy. Next, the etiology, symptomatology, progress, duration, and termination, the diagnosis, prognosis and treatment of the above affections, are well and judiciously, though succinctly discoursed of. The following, Dr. Faye conceives, are the uses of the vesiculæ, respecting which, our readers are aware, there have been and still are discordant opinions, among the most eminent physiologists.

1. "The vesiculæ receive the semen secreted by the testicles, which they partly retain, partly absorb, by a peculiar property of their internal membrane.

2. "They secrete some mucous fluid, which enters into intimate commixture with the semen received from the deferent vessels.

3. "They act a principal (?) part (maximas partes,) in ejaculating the semen.

4. "They have no insignificant share in stimulating and sustaining the sexual instinct." (pp. 25, 44.)

We may add that the anatomy of the seminal vesicles given by Dr. Faye is derived from a *personal* examination of thirty adult subjects.

The latin, in which Dr. Faye's treatise is written is tolerably pure, and is not inelegant.

We had here, as we thought, completed this article, when we received the third and last volume of M. Lallemand's treatise, which is only just published, and also, the pamphlet of M. Civiale which we believe is only printed for private distribution. About the same period an important communication on the subject of the article by Mr. Phillips made its appearance in the Medical Gazette.*

The appearance of these publications induces us somewhat to extend our remarks. The monograph of Civiale is the most important of the three, and that, accordingly, on which we shall bestow our chief attention. We shall, however, in the first place, make a few observations on the relatively very voluminous " tome" of M. Lallemand.

There seems to us to be in this more than in any of the preceding volumes of M. Lallemand on the same subject, more decided symptoms of mere book-making; and a more obvious tendency to exaggerate the importance of the subject treated of. There is little or nothing essentially new in this last volume; little or nothing which has not only been referred to, but even *sufficiently* discussed in one or other of the former volumes on seminal discharges. In short, the present publication may be described as a mere paraphrase of parts of the preceding ones; those portions of it which have any claims to novelty, comprising a very small part of the volume, and that the least important.

In the third volume, the " general symptoms" which characterize, or are induced by involuntary seminal discharges, are the ostensible subject of discussion. We shall simply enumerate a few of these ; infecundity, fever, disorders of digestion, nutrition ; affections of animal temperature, (caloricité,) calvities, affections of normal " phonation," lesions of respiration and circulation, of innervation, under which head are treated, " myotility," sensibility, gustation, olfaction, audition, vision, &c., with notices of the morbid changes produced in these, by the discharges in question. In all this part of the volume, and in the succeeding portion, on to the 238th page, in which various alleged " general affections," (many of which appear to us mere modifications of each other,) are described, there is nothing which does not appear to us to have been adequately discoursed of previously. The " treatment" which extends from page 241 to page 470, is hardly anything else but a repetition of the means, local and general, already amply adverted to by the author.

The subject of prophylaxis is next again treated of ; and the following additional remarks introduced at page 487, we shall quote, as they precisely confirm the opinions we have ourselves expressed in a former paragraph :

" However the most efficacious of these coercive measures cannot perfectly succeed except with infants. After puberty, the secretion of semen cannot be suspended or even sensibly diminished by any means compatible with health ; the accumulation of this fluid in the seminal vesicles must accordingly produce importunate erections, inevitable relapses, or else nocturnal and diurnal pol-

* Observations on Seminal and other Discharges from the Urethra; with illustrative cases. By Benjamin Phillips, F.R.S., Surgeon to the St. Mary-le-bone Infirmary, &c. —London Medical Gazette, Nos. xiii and xvii, January, 1843.

lutions; all which cannot be prevented, save by sexual intercourse. This means chiefly it is that can recall to the normal state the deteriorated functions, and modify the perverted sensibility of the organs. It is the sole really effectual means both for the present and the future, the only one that can completely re-form unnatural tastes, by making the patient perceive the immense distance which separates his melancholy pleasures from those physiologically procured."

The volume closes with some reflections of considerable interest on the political causes, consequences, and preventives of masturbation; and on the due regulation of the sexual appetite. Having already stated that we must decline, on the present occasion, entering upon the theoretical branch of the subject, and on the highly important questions in regard to social economy and public morality, connected with or resulting from the sexual instincts and relations, we pass without further remark to the pamphlet of M. Civiale.

The small treatise of this distinguished lithotritist is principally directed to the consideration of the effects of cauterization in cases of *stricture;* consequently, it does not properly come within the scope and design of the present article. Towards the end of the pamphlet, however, the author treats of cauterization as applied to the cure of urethral discharges; although he does not, so far as we can perceive, intend that *seminal* emissions should be comprised under that term. Hence no small part of the objections of M. Civiale do not apply altogether to M. Lallemand's praises of cauterization as used in spermatic discharges. We willingly admit that M. Lallemand over-rates the advantages of cauterization; and that, besides it, many means are requisite to the removal of in-voluntary seminal discharges, and to the restoration to the genital or-gans of their due actions and vigour; such as abstinence from mastur-bation; moderation in venery where it has been excessively practised; the adoption or more frequent use of it, where it has been too little en-gaged in, &c.; still we hold the opinion already expressed, that in the commonest cases of seminal discharges, depending on excited sensibility and chronic vascular irritation of the mucous membrane of the spermatic passages, cauterization is undoubtedly one of the most efficient curative means; nor do we find in M. Civiale's monograph anything to invalidate our persuasion.

Still the opinion of so experienced and enlightened a practitioner as M. Civiale allowedly is, must always carry weight with it; and we think it proper to quote the following passage from his pamphlet, in which the difference of his experience in cauterization and that of its partisans, is accounted for on grounds which, if well founded, would tend consi-derably to modify the otherwise favorable opinion which we might be inclined to entertain of it. We are bound to state, that in our practice we have not met with the inconveniences referred to by M. Civiale; although we have had an eye for considerable periods of time on the sub-jects of operation; and as we rather suppose, from the tenor of his re-marks, that M. Civiale refers to cauterization of the urethra generally, not of that part where the prostate is situated, and where cauterization may be practised without the same risk of the ill consequences alluded to by M. Civiale, as if the operation where performed on the anterior parts of the canal, this further circumstance must be kept in mind in con-sidering his objections.

After informing us (page 54,) that " the greater part of the patients whom he saw, had not been cauterized by him, but had sought his aid in order to be delivered from the sufferings which cauterization had caused them ;" he goes on to say :

" Thus, the facts presented in my practice are not in favour of cauterization of the urethra and of the neck of the bladder.   They contrast so strangely with those which other practitioners have collected, that I think it useful to indicate the cause of this difference. One might suppose that the facts are contradictory ; that there is error or mis-statement in the returns of one party or the other ; and yet there is not.   A man contracts a blenorrhagia ; the disease persists ; various simple means are employed without benefit. Nitrate of silver is applied, and the discharge ceases. The patient is lost sight of, and is reported cured. He is so in fact, in so far that the discharge has ceased to exist. . . . . . but at the end of some months, slight difficulty in making water is perceived ; there are irritation, smarting, sensibility in the testicles, often also a discharge. Demulcents are employed ; the state of matters is relieved, and the patient is satisfied. In all the cases, when he feels the necessity of calling in the aid of art, he applies, either to his ordinary medical attendant, or to surgeons celebrated for the cure of the affection by which he is attacked ; seldom does he return to the practitioner who treated the blennorrhagy, and that for different reasons easy to conceive.   The partisan of cauterization, therefore, has but few opportunities of observing the secondary effects of the means which he employs.   He acts *bona fide*, in announcing his success ; but this *bona fide* does not prevent him from being deceived." (pp. 56-7.)

The author goes on to remark that the same observations apply to the use of caustic in cases of stricture ; which affection, (be it here noticed,) Civiale seems to be of opinion, is always better treated by dilatation than by cauterization ; nay, he even maintains that the latter method is and must be, in *every* case, either impracticable or useless : impracticable, if the stricture is so narrow as not to admit of the passage of dilating instruments ; since in this case the caustic cannot be applied to the morbid excrescence or callous contraction itself (causing the stricture,) but to the part or parts *anterior* to these ; useless, since if a *porte-caustique* can pass, so might a simply dilating tube, which being the case, it follows, according to Dr. Civiale, that the case might be treated without caustic.

In confirmation of the views above quoted, as to the occasionally disastrous results of cauterization in cases of urethral discharge, Dr. Civiale cites three cases which had presented themselves to him on the same day.

" One," he informs us, " had been under treatment, during eighteen months, by a skilful surgeon of Paris. He had been successively scarified and cauterized. This unfortunate person, of a very irritable temperament, dragged on a painful existence ; his genital organs were become so sensible, as not to be able to endure the contact of the patient's clothes.   Another individual came from London, where he had been subjected to antiphlogistics, to cubebs, to balsam of copaiva, and, finally, to numerous cauterizations ; his genital organs were not excessively painful, but the walls of the urethra had acquired such hardness and roughness ; the surface of the canal was at the same time so irritable, that the emission of urine was very painful ; treatment of three months' duration was required to re-establish him. The third was a young physician, to whom the perusal of certain works on strictures of the urethra, had proved disastrous. For a simple uretritis of some days' date, he had been subjected to injections with a solution of nitrate of silver ; and although there had not been above a quarter of a grain of the salt to the ounce of water, or, as M. Deberrey would say, for that very reason, there had manifested itself, in the deep part of the urethra, and at the

neck of the bladder, pains dull but excessively obstinate; the discharge had disappeared, but the pains, which extended to the sacrum and pubis, had plunged the patient into such a state of melancholy, that I was not without fears for the result. At the end of some weeks, he quitted Paris, and I have seen him no more." (pp. 55-6.)

It must not be inferred from the above quotation, that Dr. Civiale means to represent the application of caustic as a generally severe or an always objectionable treatment. On the contrary he asserts that, according to his experience, the operation, as regards severity, does not merit the strong terms occasionally used by M. Lallemand himself. This result he indeed partly accounts for from the fact that in many cases both of stricture and of seminal emissions, in which caustic is applied or supposed to be applied to the urethra, no such application actually takes place; the caustic being dissolved in the urethral mucosities and never coming in contact with, or only very imperfectly acting on, the mucous membrane; and he seems to be of opinion that when the caustic does come in contact with the mucous membrane, the pain is *always* very acute. He discusses the question whether the caustic is best applied in the solid or liquid form; and alleges in behalf of the latter method that it has a real advantage over the mode of cauterization proposed by M. Lallemand, that, namely, of acting in " a manner more uniform and more general; so that, if by the former mode, healthy parts are attacked as well as morbid ones, at least these last are not passed over, a circumstance which may happen when one pencils the walls of the bladder." (p. 523.) We must also find room for the following final quotation :

" Let me be permitted to add one reflection. The partisans of cauterization of the neck of the bladder are not agreed amongst themselves as to the sensation which it produces. The pain is slight according to some; acute, according to others. It is even possible that it may persist, and that accidents may hence result. Hence attempts have been made to combat and prevent the consequence of the cause which provokes it (the pain). As it has been attributed to the loss of substance, to the ulceration determined by the caustic, attempts have been made to favour the cicatrization of the surface acted on, by applying a cerate in which is incorporated a small quantity of acetate of lead and of opium." (p. 48.)

After pointing out the " impossibility" of efficiently applying this cerate, M. Civiale adds :

" Moreover, into what strange contradiction do they fall who tell us that the nitrate of silver is of such marvellous efficacy in removing those ulcerations to which they ascribe obstinate urethral discharges, yet who, on the other hand, represent it as itself the source of ulcerations causing grave consequences, which they try to obviate by impracticable applications of cerate." (p. 49.)

Dr. Civiale's monograph is written with his usual facility and his usual talent; it contains in a short space much practical information and is plainly the production of an enlightened, skilful, and experienced practitioner; it adduces some facts and details and observations which must modify, in some degree, both the use and the reputation of cauterization; still the pamphlet, partaking somewhat of the character of a formal philippic against cauterization and M. Lallemand, is to be estimated accordingly, and Civiale's statements are to be received with the same reservations with which those of the professor of Montpellier ought to be. From the facts and arguments adduced in the course of this article, every

judicious practitioner will be enabled to form a tolerably fair judgment of the merits of cauterization.

As we find that in the preceding pages, which were written before the appearance of Mr. Phillips's papers in the Medical Gazette, we have adverted to all the facts and observations which he has so seasonably given to the profession, we shall make no further remark in regard to the papers referred to, except to express our opinion of their value and to recommend them to the reader's attention. There is, indeed, one direction given by Mr. Phillips to which we may call attention. He says :

"When the primary cause of the affection has ceased, it is necessary to examine the urethra with an exploring instrument; and for the purpose I prefer an elastic catheter. The point where the pain is most acute must be accurately noted. The instrument must then be passed on carefully until urine passes along it. Observe how far it has penetrated, and having noted this, you must arrange your caustic apparatus so that it shall not reach so far by an inch, because the prostatic portion of the canal is not commonly implicated in the irritation. The point upon which the caustic is to be applied is, as near as practicable, about the region of the orifices of the ejaculatory ducts." (Med. Gaz., Jan. 1843.)

We must own that we attach little practical importance to this caution, and are of opinion that Mr. Phillips will find, that according to his own plan of cauterization, nearly the same point of the urethra is operated upon as is done when the method described by Mr. Curling and already quoted, is had recourse to.

In conclusion, we would make two observations of a somewhat desultory nature. The first is, that, in perusing the last volume of M. Lallemand, we have been astonished and displeased, we had almost said disgusted, at the inconsiderate endeavour of the author to father almost every symptom, every ailment which individuals may labour under, on involuntary seminal emissions, the consequences of inordinate venery or still more vicious habits. If M. Lallemand were to be credited, every man who has a melancholy or abstracted air, who is hypochondriac, who is somewhat unsocial, who, with unusual care, eschews vinous or spirituous drinks, &c., *ought* to be suspected to labour under involuntary seminal discharges! What an imprudent and injurious and ridiculous exaggeration is this! We know persons who not only exhibit all the symptoms we have just enumerated, but who have (what M. Lallemand believes to be impossible) a nearly total disrelish for sexual intercourse, yet without having either nocturnal or diurnal emissions, and who, moreover, never practised self-pollution. We have at this moment patients such as we describe under our care ; and we therefore feel indignant at the attempt of M. Lallemand to refer every innocent appearance of mental or of physical languor to a malady, the ordinary and most frequent causes of which are of an opprobrious and disgraceful kind. The tragical fate of Delpech, the late distinguished surgeon of the same city in which Lallemand himself practises, ought to be a warning to him not rashly to indulge in such surmises.

Our second remark is, that perhaps the tendency to frequent expulsions of the semen which follows continued masturbation or excessive venery long practised, may be accounted for not solely from a state of chronic irritation and morbid sensibility in the seminal ducts and vesicles, but also from an actual diminution of the size of these, and, consequently, of their power of containing beyond a certain and that a less than the

normal quantity of spermatic fluid. We know that persons, boys for example, in the habit of frequently emptying their bladders, at length cannot contain more than a small quantity of urine; the bladder having most probably become somewhat contracted, simply because it has been seldom—for a greater or less length of time—called upon to contain an ordinary quantity of urine. If this view of the source, in part, of seminal discharges be well founded, (as we rather suspect it to be,) it has practical consequences as regards treatment. It explains the slowness and gradual nature of the cure; the tardiness with which the spermatic receptacles regain the power of containing a normal amount of semen; it encourages perseverance both in the patient and practitioners. Possibly, the beneficial effect of nitrate of silver applied to the orifices of the seminal ducts is in part due to its astringent action on these, and its thereby *compelling*, as it were, the diverticula to admit a larger supply of semen, and to retain it for a longer time, than they were lately used to do.

Art. VI.

Elements of General Pathology. By the late JOHN FLETCHER, M.D. Edited by JOHN J. DRYSDALE, M.D., and JOHN R. RUSSELL, M.D.— *Edinburgh*, 1842. 8vo, pp. 519.

THAT a sound and readable treatise on general pathology, sufficiently elevated in its character to be of value as a scientific work, and yet not too much raised above the comprehension of the average student-mind of the present generation, is one of the greatest desiderata in our medical literature, few will be disposed to deny. How far we consider that the volume before us supplies the deficiency, will presently appear. We must, in the first place, very much question the judgment of the editors in submitting to the world, after an interval of six years, during which the aspect of pathological science has undergone many important alterations, a treatise which it may be safely affirmed that its author himself would not have published in its present form. The materials put into their hands were nothing more than " notes of lectures, often scarcely intelligible ;" and rather than take any such liberties with these, as it seems to us that the necessary transformation of them would have fully warranted, " they have scrupulously adhered to the author's text, and have added in editorial notes what seemed necessary to completeness, and sufficient to put the reader in possession of what has been done in the science up to the present time." Now if it had been of any great consequence to the world to know the exact opinions of Dr. Fletcher on any given subject, if he had possessed the profoundly-philosophic intellect of a Haller, or the all-grasping intuition of a Hunter, this would certainly have been the proper course. But neither in physiology nor in pathology could we regard with satisfaction, as a proper guide to the learner, the writings of *any* man, however eminent in his time, which had remained during a period of at least six years of this eventful epoch, unmodified save by editorial additions. Such additions, if faithfully made, must in many instances directly contradict the text ;* and we need not say how perplexing to the student this kind of instruction must be.

* See Dr. Bostock's Physiology, 3d edition, for many instances of this kind. No person can have a higher value than ourselves for this work, as a learned collection of the opinions of the most eminent physiologists ; but few, we think, would now regard it as anything but a sort of bibliographical record.

The perusal of the volume before us has not in any respect altered the opinion of the character of Dr. Fletcher's mind, which we formerly expressed when reviewing his Rudiments of Physiology. (vol. V. pp. 93-8.) We find in it examples of the same closeness of reasoning, the same ingenuity of argument, the same acuteness in exposition ; but we also find instances of the same superficial dogmatism, the same carelessness as to the data on which the reasoning is founded, and the same overweening confidence in the superior value of his own conclusions.   Did we think that the work was likely to become a popular one, we should feel it necessary to point out these, for the sake of putting our readers on their guard against its specious fallacies.   But as we think that its influence will be too limited to render this necessary, we shall satisfy ourselves with a concise analytical view of its contents, stopping to notice briefly whatever we deem most worthy of remark for its excellence or the opposite.

The work is divided into three books, devoted to Etiology, Semeiology, and Therapeutics, respectively.   It seems to us that many of the subjects included under the first two of these heads have no claim to their position. Thus, after the *remote causes*—the *exciting causes*—the influence of the various vital stimuli, as *light, electricity, air, aliment*—the mental stimuli, as *sympathy* and the *passions*—accidental stimuli, as *hemorrhage, venoms*, &c., and the *excretions, exercise*, and *sleep*, have been discussed, the author carries us on through the proximate cause, (which, if we regard disease as a *morbid action*, and not as a collection of symptoms, is nothing else than the disease itself,) to *inflammation*, with its many theories—to *fever*, no less prolific, thence to *increased secretion—natural tissues in excess—tubercle* and *cancer—calculi* and *deposition of fluids—increased depositions of halitus and blood—preternatural fluids*—and lastly *functional proximate causes*, among which are included all the spasmodic actions.   It seems to us, and probably will to our readers, that in the introduction of all the latter group of subjects under etiology, there is an extraordinary jumble of ideas, which we can scarcely attribute to so clear a mind as Dr. Fletcher's.   That it may have proceeded from the editors we are led to apprehend, by finding several important novelties regarding the introduction of organic agents into the body, (such as parasitic growths, ferments, &c.) inserted in the chapter on light, electricity, and air, instead of in that on accidental stimuli, in which they would have been grouped along with the animal poisons, to which they have the clearest analogy.   We are surprised also to find appended to this same chapter, an account of Andral's late researches on the alterations which the blood undergoes in disease, although that subject is clearly akin to all those which occupy the later portions of the book.

Similar inconsistencies are encountered when we go into detail.   Thus in p. 2, note, the author incidentally tells us that " neither health (i. e. natural action) nor disease (i. e. morbid action) are entities, but abstractly signify different modes of being, or the same mode of being under different circumstances.   Whilst in p. 5 we are formally told that " it is surely better to call by the name of a disease such a collection of symptoms ; and by the name of a proximate cause such a morbid condition of the body as immediately gives rise to them."   We do not think it of much consequence which definition is adopted ; but whichever it be, it ought to be strictly adhered to.   There is a certain practical conve-

nience in applying the term disease to the collection of symptoms ; but in a scientific treatise on pathology, we apprehend that it is scarcely possible to maintain this application throughout, except with a most undesirable amount of circumlocution ; and we find our author in many places departing from his formal definition, and going back to his incidental one.

Of the degree in which this work gives a correct view of the present aspect of the science of which it treats, we may adduce a very characteristic example from chapter ii. where we find the following denunciation of the humoral pathology :

"Others have endeavoured, at least partially, to renew the effete theory that these causes operate by producing some primary change in the blood ; but it is unnecessary to dwell particularly on the merits of a system so totally vague. . . . Of the existence of any primary change in the properties of blood, as resulting from the exciting causes of disease, there is neither proof nor probability. Besides, *it is not the blood, but the solids, that are the seat of disease ;* so that the blood, even if primarily affected, can be regarded only as the last link in the chain of exciting causes, and these causes must still operate upon the solids before they can produce their effect." (p. 48.)

This dogmatic assertion, the fallacy of which is now so palpable, is in harmony with our author's equally dogmatic assertion in his physiology, that the blood is totally destitute of vitality ; a doctrine in which we apprehend that he would no longer find any support from those who are acquainted with modern science.   It must be well known to our readers that the tendency of nearly all pathological researches during the last few years has been to reestablish the humoral pathology on a sounder basis, and with a more accurate knowledge of the actual changes involved ; and that, as if to prove that " there is nothing new under the sun," the very terms *fermentation* and *putrefaction* of the fluids, on which so much ridicule has been cast, are now found most accurately to indicate the nature of the morbid alterations which they undergo.   Of the facility with which Dr. Fletcher frames hypotheses upon the loosest data, whilst exposing the inconsistencies of others (in which respect he strongly resembles Magendie), the following quotation may serve as an example :

" It is remarkable that the protoxide of nitrogen, previously to occasioning asphyxia, commonly gives rise to a kind of delirium, attended with very pleasing sensations, and an uncontrollable propensity to laughter.   The cause of this is, unquestionably, a specific irritation excited in the lungs by this peculiar stimulus, which is conveyed to the brain in the manner of sympathy ; in the same way as ordinary intoxication is to be ascribed to a specific irritation excited in the stomach by spirituous liquors, and conveyed to the brain in a similar manner." (p. 64.)

The editors have not here added a note to contradict their text, as they have frequently done elsewhere ; but they certainly might have known, from one of the most important prize theses which their university has produced, that the influence of alcohol on the functions of the brain is not due to a "specific irritation conveyed to the brain in the manner of sympathy ;" but, as Dr. Percy has given strong reason for believing, to the direct action of the alcohol on the nervous matter.   Our author has subsequently carried out the same erroneous view, in regard to the action of all poisons.   Thus he remarks that

" The fact cannot be too forcibly insisted on, that we have no evidence whatever, that any primary change in the blood (the presumed necessity of which has been principally instrumental in propagating the vague notion respecting the absorption of poisons,) is at all essential to the action of any one of them. It is much more probable, that when poisons operate on parts at a distance from the organ to which they have been directly applied, they do so by exciting in the organ a peculiar irritation, which, when conveyed by sympathy to the other parts of the body, produces its principal effects on that part which is most adapted by its specific irritability to be so acted upon." (p. 101.)

On this head the editors have endeavoured to do justice to the reader by adding a long note, in which many of Dr. Fletcher's objections to the doctrine of absorption of poisons are answered; but we will simply ask, Is this the proper mode of teaching pathology? In a subsequent chapter the same doctrines are inculcated by Dr. Fletcher, in regard to the non-absorption of the poisons of syphilis, variola, hydrophobia, &c., which he believes to act as specific stimuli only on the parts to which they are first applied, and sympathetically as to all those at a distance. We need not tell our readers how many important facts have been accumulated during the last few years, which prove the erroneous nature of this doctrine; and we much regret that they are not here noticed by the editors, who content themselves with referring to the previous discussion on the operation of poisons in general.

It is rather amusing to contrast Dr. Fletcher's own explanations with those which, when given by others, he so acutely ridicules. Thus when speaking of the opinions of Dr. Ewings that dyspepsia " consists primarily of muscular spasm, membranous irritation, and nervous uneasiness," he remarks that " it unluckily displays too much observational sinisterity, ratiocinatorial impotence, and phraseological unintelligibility to be made anything of, and is one of the best examples of the substitution of words for ideas, even in the fruitful field of pathology," (p. 393, note.) Again, when alluding to the doctrine of a recent nosologist, who refers subsultus tendinum to the " principle of irritation, which is often apt to accumulate in the tendinous extremities of the muscles," he remarks : " A man would leave a warehouse with a particularly clear idea of the mechanism and powers of the crane employed in raising bales of goods, if told by the person employed to instruct him, that the said bales were raised by a principle of irritation, often apt to accumulate in the ropes attached to them; yet of a precisely similar nature is the vague and unmeaning trash which is often held out by pretended medical theorists under the head of explanation," (p. 443, note.)   Does not this just severity, we would ask, apply equally well to our author's own attempt at explaining the action of morbific agents, as a " local specific irritation, conveyed in the manner of sympathy to distant parts ?"

We have left ourselves but brief space to enumerate the contents of the second book. The first chapter, on nosology, has for its purpose chiefly to prove that systematic nosology is a useless science; in which we quite agree with him, so long as definitions of disease are to be founded upon symptoms and not upon the nature of the morbid action they involve.   The heads of the succeeding chapters are as follows : *Anatomical symptoms—respiration—auscultation of respiration—circulating system —digestion—sensations—thought—voluntary motion.*   The whole of the

portion referring to auscultation has been rewritten by the editors, who are well-known followers of the doctrines of Skoda; and altogether this book seems to us to be much less faulty than the preceding, and to contain much that the student will not find elsewhere brought together in the same intelligible form.

The last book, on Therapeutics, may be considered disproportionately short, as it only occupies about one seventh of the whole volume; and the numerous subjects of which it treats are certainly disposed of in a very summary manner. The author commences by pointing out that therapeutics is strictly a branch of pathology; since the agents of which it treats have the same kind of bearing on morbid conditions of the body, that heat, air, aliment, &c. have upon the body in health, a doctrine which we took occasion to bring forwards some years since. (vol. VI. p. 109.) He then considers the general indications for treatment, and especially prophylactic treatment; under which head the editors introduce a short account of the German " Wasser-cur." The second chapter treats of the general action of medicines, and is liable to the same exceptions which we have already taken against our author's doctrine of poisons and morbific agents. At its close are some acute observations on the homœopathic system, which seem to us to analyse the strange mixture of truth and error it contains in a very judicious manner. The editors give, in a long note, a fuller account of the history and progress of the doctrine; and intimate that " having paid considerable attention to the question of the applicability of the homœopathic principle to practice, they have arrived at conclusions somewhat different from, and more favorable than, those deduced from theoretical grounds alone by Dr. Fletcher." (p. 498.) In the third and fourth chapters, our author takes a general survey of the different classes of medicines; but this is much too brief to be either practically or scientifically useful to the student. He treats with much ridicule the attempts which are being made to reduce medicinal agents to their simplest forms; and justly regrets that " any compound medicine of acknowledged efficacy should ever be wantonly expunged and voted inert, because we cannot explain why it should be otherwise." But he says nothing of the many advantages which attend this simplification, both as regards their scientific study of the modus operandi of the various agents upon the system, and with respect to their application in practice. In this, as in other instances, it must be remembered that " ridicule is not the test of truth," even though it should appear so apposite as that contained in the following sentence, with which the volume concludes, and with which we shall close our quotations from it:

" It is the same lopping and pruning spirit, aided by the recent improvement in the art of chemical analysis, which has led to the rejection in many cases, not only of compounds in general, but even of crude simples, in favour of one or two of their proximate principles, in which we are pleased to consider that all their virtues reside; and there can be little doubt that, if their improvement proceed much farther, a middle-sized man will not only be able to take all the medicine he may have occasion for on the point of a needle, but, instead of sitting down, as at present, to his pound-and-a-half of mutton chops and pot of porter, will swallow for his dinner a fine [five?] grain pill, composed of equal parts of ovine and cerevisine, or some such matters, which science has yet to be delivered of."

It may be thought that, in our account of this volume, we have too far transgressed the laudable principle "de mortuis nil nisi *bonum*." But we much prefer the version of it which we were accustomed to learn in our youth from the lips of one of the most upright and benevolent of men, "de mortuis nil nisi *verum*." We have felt called upon to express a decided opinion as to the character of this work, and the probability of its injurious influence upon those who may peruse it without the advantage of a previous more correct knowledge of the subject. Painful as this opinion may be to the friends of Dr. Fletcher, we cannot but lament that they have drawn it upon themselves by a publication which, we feel assured, *he* would never have permitted to go forth in its present form, and which *they* would have best consulted his reputation by leaving undisturbed. We have felt it necessary to expose some of his errors, because we are confident that so far as his opinions are received they must operate to the retardation rather than the advance of science. And we have adverted to defects in the character of Dr. Fletcher as a philosopher, because we would present him, to our younger readers more especially, as an example of the fact, that no closeness of reasoning can be relied on, so long as the data are unsound; that no acuteness in perceiving and exposing error can be of any avail, as long as it is exercised only towards others and not against self; and that no deductions can be sound, in which any facts that bear upon them are excluded from consideration. That many valuable facts and many important suggestions are brought together in this treatise, no one who duly appreciates Dr. Fletcher's character can doubt; and we may add that much of the matter interpolated by the editors is well deserving of attention, being derived from sources which are but little known in this country.

Art. VII.

1. *A Practical and Theoretical Treatise on the Diagnosis, Pathology, and Treatment of Diseases of the Skin; arranged according to a natural System of Classification, and preceded by an Outline of the Anatomy and Physiology of the Skin.* By Erasmus Wilson, Consulting Surgeon to the St. Pancras Infirmary, Lecturer on Anatomy and Physiology in the Middlesex Hospital School of Medicine, &c. &c —*London*, 1842. 8vo, pp. 407.

2. *Manual of Diseases of the Skin.* From the French of MM. Cazenave and Schedel. *With Notes and Additions by* Thomas H. Burgess, m.d., Surgeon to the Blenheim-street Dispensary for Diseases of the Skin, &c.—*London*, 1842. 12mo, pp. 320.

3. *Nouvelle Dermatologie, ou Précis théorique et pratique sur les Maladies de la Peau, fondé sur une nouvelle Classification médicale, avec un Formulaire special et Planches coloriées.* Par P. Baumès, Chirurgien en chef de l'Hospice de l'Antiquaille de Lyon, &c. &c.— *Paris*, 1842. Deux Tomes, 8vo, pp. 560, 622.

   New Dermatology; or a Theoretical and Practical Treatise on Diseases of the Skin, founded upon a new medical Classification, with a special Formulary and coloured Plates. By P. Baumès.—*Paris*, 1842. Two Volumes.

Previous to the publication of Willan's works, several circumstances

combined to retard the study, and check the advance of our knowledge of cutaneous diseases; the principal of which were the obscurity and imperfections of the discriptions of the individual affections handed down to us, and the disagreement in nomenclature and classification between different writers upon the subject.   The most opposite terms were often employed to designate similar diseases; and the several stages of the same affection were often described as disorders essentially different from one another.   To Willan, and his successor Bateman, the profession is in a great measure indebted for the subsequent advances which have been made, and for many of the improvements which have taken place in this department of medical science.   It must however be confessed that the cultivation of cutaneous diseases as a distinct branch of pathology, has in some measure languished in this country since the death of Bateman. The introduction of the stethoscope, and the brilliant discoveries to which it paved the way, seem of late years to have almost engrossed the attention of physicians, and to have drawn them away from the study of other important diseases.   We hail, therefore, the almost simultaneous appearance of the two English works, the titles of which we have prefixed, and the announcement by the journals of a third, as indications that this portion of the field of medical science is beginning again to attract the attention of the profession, and to take the position which its importance demands.

The earliest attempts at a classification of cutaneous diseases were necessarily very imperfect.   In one of the most ancient they were arranged according to their situation : one division had its seat upon the head, or face; the other upon the body, or extremities.   This classification was partially adopted by Turner, one of the earliest English writers on the subject, and was the groundwork of Alibert's first classification.   Again, cutaneous diseases were arranged according to the supposed cause producing them, and two divisions were made as they depended upon external or local, and internal or constitutional causes.   Subsequently they were arranged in two classes, according as they had an acute or chronic character; but as this mode of classification necessarily, in many cases, separated the acute and chronic stages of the disease, and required them to be treated of in separate sections, it never was generally adopted. The only modern classification which approaches this in simplicity we had the good fortune to learn in the days of our pupillage; its author (a practitioner of the old school) never published upon the subject, and but for the opportunity afforded us here, it would probably have been altogether lost to posterity.   Therapeutics formed the basis of this classification, and in it cutaneous diseases were arranged in four orders or groups.   The first included diseases curable by sulphur.   The second contained the diseases curable by citrine or tar-ointment.   The third included diseases curable by Plummer's pill; and the fourth, diseases which could not be referred to any of the foregoing orders, and required more active medicines.

The first classification of cutaneous diseases, deserving the name of scientific, was that of Professor Plenck, of the university of Buda, founded upon the external appearances of the eruptions; which was soon succeeded by the well-known one of Willan, founded upon nearly similar principles; namely, the character which the eruptions present when perfectly and fully developed.   The object of this classification was to facilitate the

diagnosis of these diseases, and as it settled the nomenclature, and fixed the meaning of the terms employed in designating them, it was calculated to lead to clearer views than any previous arrangement, and met with a very favorable reception from the profession at the period of its publication ; indeed it was not only almost exclusively followed in this country, but it received the nearly unanimous approval of our continental neighbours, by whom it was characterized as the most methodical and accurate of all the classifications of diseases of the skin hitherto proposed.

Since the death of Bateman, the profession in this country (with one or two exceptions) seems to have been content to follow in his footsteps, considering that the Willanean classification was as perfect as the nature of the subject permitted.   In France, too, the system of Willan, with slight modifications, was adopted by the most distinguished teachers and writers; as, for instance, Biett, Rayer, Gibert, Cazenave and Schedel. Alibert, however, must be excepted; who, at different periods, proposed and taught two distinct forms of classification : but his systems (as Mr. Wilson observes) live at the present day only in the memory of the past, and have ceased to exist even beneath the foliage of the ' *tilleuls*' that smiled upon their birth.   Mr. Plumbe, in this country, was the first systematic writer who called in question the classification of Willan, and proposed a different one ; " the basis of his arrangement being founded on the constitutional causes of the disease, and due consideration of the organic structure and physiology of the part of the skin on which it is seated."   There is, unquestionably, (as Rayer observes,) considerable ingenuity in several parts of Mr. Plumbe's classification, but it is inferior to that of Willan, and it never was generally adopted in this country.

The classification followed in the Manual of MM. Cazenave and Schedel (so well translated by Dr. Burgess) is that of Willan, modified and improved by M. Biett.   In this method, cutaneous diseases are arranged in fifteen orders ; the first eight, or principal orders, contain the great majority of cutaneous diseases.   The following table, given at page 5, contains a view of this arrangement.

" Order 1. *Exanthemata.*—Erythema, erysipelas, roseola, rubeola, scarlatina, urticaria.

" Order 2. *Vesiculæ.*—Miliaria, varicella, eczema, herpes, scabies.

" Order 3. *Bullæ.*—Pemphigus, rupia.

" Order 4. *Pustulæ.*—Variola, vaccinia, ecthyma, impetigo, acne, mentagra, porrigo, equinia or glanders.

" Order 5. *Papulæ.*—Lichen, prurigo.

" Order 6. *Squamæ.*—Lepra, psoriasis, pityriasis, ichthyosis.

" Order 7. *Tubercula* —Elephantiasis Grecorum, molluscum, frambæsia.

" Order 8. *Maculæ, Colorationes.*—Fuscedo cutis, ephelides, nævi. *Decolorationes.*—Albinismus, vitiligo.

" Order 9. Lupus.   10. Pellagra.   11. Malum Alepporum.   12. Syphilida. 13. Purpura.   14. Elephantiasis Arabica.   15. Cheloidea."
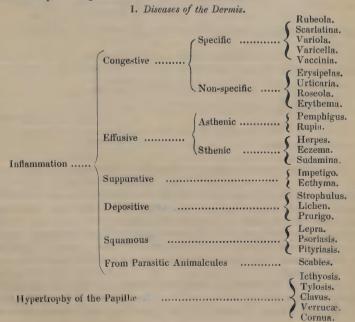
This arrangement agrees, in most respects, with that of Willan : the first eight orders are similar to his, and differ only in the position of some of the genera.   For instance, erysipelas has been very properly removed from the order Bullæ ; scabies is a vesicular, not a pustular disease ; acne and sycosis, which Willan classed with tubercular diseases, have been placed in the order Pustulæ ; pemphigus and pompholyx are considered to be varieties of the same disease, and are both described under the term

pemphigus; purpura, classed with exanthemata (with which it has no analogy), and lupus with tubercle, by Willan, have been both placed in orders by themselves.

Willan's classification has been called artificial, because it is founded upon a single character, (viz., the appearances presented by the diseases when at their full development,) and because neither the etiology nor the tissue affected are taken into account as elements of the arrangement. "In this respect it corresponds very aptly," Mr. Wilson observes, "with the Linnæan system of classification in the vegetable kingdom, which is likewise designated artificial. But while the Linnæan system is admitted, on all hands, to be that by the aid of which a tyro may most certainly and expeditiously discover the name of a flower, and then, by referring to his books, learn its history and properties, the system has fallen into disrepute among skilful botanists, and has given place to one founded on a more philosophical basis, which is called the natural system." (p. viii.) While examining the advantages and disadvantages of Willan's arrangement, and comparing with it the classification applied to botanical science, the idea occurred to Mr. Wilson that a natural system of arrangement might be applied to diseases of the skin; he followed up this idea, and the result has been the production of a classification, which he terms, "A Natural System of Diseases of the Skin." The basis of this classification "rests upon anatomy and physiology...... The dermis and its appendages, its glands and follicles, are considered to be the seat of all the changes which characterize cutaneous pathology." These, therefore, constitute the four primary divisions; and the following tabular view, contained at p. xxv, gives an outline of his classification.

I. *Diseases of the Dermis.*

Disorders of the Vascular System .... { Vascular nævi. / Purpura.

Disordered Sensibility .... { Hyperesthesia. / Pruritus.

Disordered Chromatogenous function ......

Augmentation of Pigment .... { Nigrities. / Pigmentary nævi.

Diminution of Pigment .... { Albinismus. / Vitiligo.

Alteration of Pigment .... { Ephelis. / Lentigo. / Chloasma. / Melesma.

Chemical Coloration .... { Oxide of Silver / Stain.

II. *Diseases of the Sudoriparous Glands.*

Augmentation of Secretion .... Sudatoria.
Diminution of Secretion .... } Abnormal odour, colour, &c.
Alteration of Secretion .... }

III. *Diseases of the Sebaceous Glands.*

Augmentation of Secretion .... Stearrhœa.
Diminution of Secretion .... } Icthyosis sebacea.
Alteration of Secretion .... }

Retention of Secretion

Duct open .... { Comedones. / Sebaceous accumulations. / Small sebaceous tumours. / (*Molluscum contagiosum.*)

Duct closed .... { Sebaceous miliary tubercles. / Calcareous miliary tubercles. / Serous cysts. / Encysted tumours.

Inflammation of Glands and adjacent Textures... { Acne. / Sycosis.

IV. *Diseases of the Hair and Hair Follicles.*

Augmented Formation .... Pilous nævi.
Diminished formation .... { Alopecia. / Calvities.
Alteration of Colour.................................... Canities.
Disease of the Hair-pulps .... Plica Polonica.
Disease of the Follicles .... { Inflammatio folliculorum. / Favus.
Abnormal Direction .... { Trichiasis. / Felting.

M. Beaumès employs two kinds of classification for cutaneous diseases; one he calls the "Dermatological," the other the "Dermatographical;" the principal novelty in his method belongs to the former. Thus, he considers all cutaneous eruptions to be the result of a morbid condition, which he terms congestion, "*fluxion ;*" and he believes the different forms which they assume may be traced to a definite number of distinct causes; upon these assumed causes his dermatological classification is based. He has made seven classes of cutaneous diseases, and the following is a summary of his arrangement.

The first class includes the cutaneous eruptions which depend upon "congestion from an external cause;" as, for instance, when the matter of a contagious disease (such as the itch) gives origin to a similar disease

in the part to which it is applied, without the constitution being primarily affected.

The second class includes diseases which are symptomatic of, and appear to depend on, some internal disease, in which case the eruption is said to be from " reflected congestion."

In the third class, a cutaneous eruption supplies the place of a suppressed evacuation, or of some morbid process in another tissue, when the disease is said to be from " misplaced congestion."

The fourth class includes diseases which are the result of some cause acting upon the whole system, either through the nerves or blood; as excesses of all kinds, deficiency of food, strong mental emotions, &c.; these he terms cutaneous eruptions from " eccentric congestion."

The fifth class contains cutaneous affections which arise from some peculiarity in the constitution or diathesis of the patient, (as the scrofulous, cancerous,) in which case the eruption depends upon " congestion from diathesis."

The cutaneous diseases placed in the sixth class are developed spontaneously, or without any appreciable cause, when the eruption is said to be by " idiopathic congestion."

In the seventh class, several of the foregoing causes may combine to produce the disease, in which case the eruption depends on " complex congestion."

In M. Baumès' "dermatographical" classification, diseases are arranged in eight orders; viz., 1, Erythematous eruptions; 2, Vesicular, or pustulo-vesicular; 3, Papular; 4, Tubercular; 5, Scaly, or furfuraceous eruptions; 6, Maculæ; 7, Excrescences, vegetations, and cutaneous tumours; 8, Diseases, or alterations of the appendages of the skin.   As there are a certain number of diseases which do not admit of being included under any of the foregoing orders, he has placed them in a section apart; viz., erysipelas, urticaria, acne, sycosis, lupus, &c. M. Baumès then subdivides the orders according to the cause which he supposes to produce each disease contained in it; but the inapplicability of this method to all cases is proved in his work, as the author has found it necessary to describe the most important diseases belonging to each order, not under the heads of his " dermatological arrangement," but in separate and distinct sections.

In regard to these different forms of classification, we must confess that old associations and early prepossessions on our side, are linked with Willan's arrangement: like the Linnæan classification of the vegetable kingdom, it is the one with which we commenced the study of the subject, and it has become almost a habit to follow and be guided by it.   One of the principal ends of a classification of cutaneous diseases is to enable the practitioner, or student, to discover the object of his search in the readiest manner possible, and with the least trouble; the Linnæan classification of the vegetable kingdom leads to the expeditious discovery of the name of the plant sought, after which other sources, for further information, can be referred to.   If the Willanean arrangement of cutaneous diseases possesses this advantage it certainly is a great one, and it should not be set aside on light grounds; that it does so is admitted by Mr. Wilson, who observes (p. viii), " none can be better suited (than the Willanean) to lead the student to the discovery of the name of the disease, when the

disease is at its height ; but if he be called to study it at the rise or the decline, the system of Willan, like the Linnæan, is but a faithless and deceptive guide." The analogy between the Linnæan classification and that of Willan does not, however, appear to us to be so close as Mr. Wilson would lead the reader to suppose. In the botanical arrangement a difficulty no doubt arises in many cases, on the fall of the stamina, or before the development of the flower ; but in a large number of cutaneous diseases, the characters upon which the eruption is classified may be detected (if carefully looked for) in every stage of the disease. With every disposition, therefore, to give Mr. Wilson credit no less for the ingenuity with which he has worked out the details of his classification, than for the talent which he has brought to bear upon the whole subject ; and admitting that his is the most scientific, and most natural arrangement, we must again repeat, that the principal object of a classification of cutaneous diseases being to facilitate the recognition of the species, and to lead to the ready detection of the disease, an arrangement which fulfils these conditions must continue to be the most popular with the student and practitioner: and so far as classification, this condition is fulfilled by Willan's system, as modified by Biett, Cazenave and Schedel, and adopted in the Manual of Cutaneous Diseases by the latter gentleman, translated by Dr. Burgess. We think, therefore, that in practice Dr. Burgess's volume will be found to obtain the preference. We wish, however, not to be misunderstood upon this point ; we are quite aware that there are positive defects in the Willanean system. From its artificial nature it must sometimes associate diseases of opposite characters, and must also separate others which are intimately allied (defects from which Mr. Wilson's arrangement is free) ; but it appears to possess these advantages over his,—that it is more simple ; the orders under which the diseases are arranged are less numerous ; and the characters by which they are distinguished from each other are consequently more readily remembered.

M. Baumès' system (founded upon the etiology of cutaneous diseases) need not detain us long ; it appears to be based upon the views of Lorry proposed so long ago as the year 1777. In some points, also, it bears an analogy to the arrangement adopted by Mr. Plumbe. Almost all writers on the subject, however, appear to be agreed that the etiology of diseases of the skin is far too obscure ever to serve as the basis for their arrangement. Indeed, M. Baumès seems (as Rayer has remarked) to have overlooked the advantages of the Willanean arrangement, to have erroneously disputed the utility of determining species, and gratuitously to have supposed that those who adopted Willan's system took no notice of the other characters of the diseases of the skin in establishing their diagnostic features. " His classification (in the words of M. Gibert) pays little attention to the characters of cutaneous diseases ; finding in congestion, revulsion, and sympathy, an explanation of all the morbid phenomena comprised in cutaneous pathology, and is calculated to throw us back into the chaos from which modern observers have extricated us."

ANATOMY AND PHYSIOLOGY OF THE SKIN. The first chapter of Mr. Wilson's work is devoted to the anatomy and physiology of the skin ; and as these subjects are not noticed in either Dr. Burgess's Manual, or M. Baumès' larger work, we shall confine our observations on this head, to an abstract of some of the details contained in Mr. Wilson's volume.

The skin, from the days of Malpighi down to a very recent period, was supposed to consist of three distinct layers, viz. the cuticle or epidermis, the rete mucosum, and the cutis, dermis or true skin. The result of the researches of MM. Breschet and Roussel de Vauzeme led them to consider the skin as composed of six constituent parts, viz., the dermis, papillæ, perspiratory apparatus, apparatus of inhalation or absorbent canals, apparatus producing the mucous matter, and an apparatus producing the colouring matter. The skin is now usually believed to consist of two layers, the epidermis and dermis; with secretory organs, the sudoriparous and sebaceous glands; and of certain appendages, as the epidermis, the hair and nails. The epidermis and dermis are each composed of two layers: the superficial layer of the former is the cuticle; the deeper layer the rete mucosum of the old writers; the superficial layer of the dermis is named the papillary, the superstratum, the corium.

The dermis, or cutis, varies in thickness in different parts of the surface: on the back, outer sides of the limbs, palms of the hands and soles of the feet, it has a greater density than upon the inner surface of the limbs, the eyelids, or scrotum, &c. It is composed of areolo-fibrous tissue, elastic and contractile fibrous tissue, nerves, blood-vessels, and lymphatics. The superficial portion of the areolo-fibrous tissue supports the papillæ, and is formed of an intricate interlacement of white fibres, collected into small fasciculi; its deeper layer is composed of broader fasciculi, which leave interspaces in which small masses of adipose tissue are lodged. The contractile fibrous tissue of the dermis is composed of fibres sometimes collected into fasciculi, sometimes interlacing; they are most abundant in the coarse network of the under surface of the corium; this structure is more readily seen in the corium of animals than in the human subject,—in the latter it has only been demonstrated in the nipples and scrotum; the appearance of the skin produced by cold, termed cutis anserina, is owing (Mr. Wilson observes) to the presence of this contractile fibrous tissue.

The papillary layer of the dermis consists of conical minute prominences, which upon the surface generally are exceedingly minute and very irregular in their distribution, but in some situations as the palm of the hand and sole of the foot are larger, and are arranged in a regular order; on these parts the papillæ are collected into little square masses, each containing from ten to twenty, which are disposed in parallel rows; and it is this arrangement of the papillæ which gives rise to the parallel ridges and furrows seen upon the palm of the hand and sole of the foot. The largest papillæ are those which produce the nail, and their form and arrangement are peculiar. Near the root of the nail, and for a short distance onwards the papillæ are minute and less vascular than those further on. "This patch of papillæ is bounded by a semilunar line of which the concavity is turned towards the root, and in consequence of appearing lighter in colour than the rest of the nail, it has been termed the *cunula*."

The epidermis is a secretion of the dermis, which it serves to protect; its superficial layer is dense and unorganized, its inner layer (rete mucosum,) is soft and cellular, and in contact with the papillary layer of the dermis. The cuticle is laminated in its texture, and as the superficial laminæ are continually removed by attrition, new laminæ are continually reproduced upon its internal surface. In situations where the cuticle is

much exposed to pressure, as the soles of the feet, it is thick ; in others it forms a very thin layer, and "its degree of thickness is dependent on, and bears an accurate proportion to the degree of development of the papillæ of the dermis. The epidermis is accurately modelled on the papillary layer of the dermis, and each papilla has its appropriate sheath in the newly-formed epidermis or rete mucosum." (p. 6.) The different tints of colour of the skin observable in different nations, depend upon the presence of pigment in the cells of the epidermis.

The sudoriparous glands are seated in the subcutaneous areolar tissue ; they are small oblong bodies, in some cases sacs, in others tubuli, ending in minute spiral tubes, called perspiratory ducts, which pass through the dermis and epidermis, and terminate by a pore upon the surface of the latter ; they are lined by an inflection of the epidermis ; the pores are readily seen upon the palmar surface of the hands.

The sebaceous glands, which are sometimes simple pouch-like follicles, at others lobulated glands, are seated in the substance of the dermis; their excretory ducts generally terminate in a hair follicle, and are lined by a reflexion of the epidermis ; they occur on every part of the surface, are numerous on the scalp, face, arm-pits, and perineum ; in the meatus auditorius they are large, and have received the name of ceruminous glands ; the meibomian glands are the largest in the body. They secrete an oily fluid which preserves the flexibility of the cuticle, and protects parts much exposed to friction.

"In a physiological point of view the skin is an organ of sensation, absorption, and secretion ; in the former capacity it affords us gratification, and warns us of the presence of injurious or destructive agents; by means of the second it is enabled to appropriate the fluids contained in the surrounding medium, and perform the office of a respiratory organ; and by means of the third, it provides for its own softness and pliancy, it regulates the influence of temperature both external and internal, and acts as an important depurating organ of the blood." (p. 14.)

CONGESTIVE INFLAMMATION OF THE DERMIS. Under this title Mr. Wilson has assembled a group of diseases, the leading feature of which is inflammation, and consequent redness of the skin. He then makes two sub-groups : the first including such as are characterized by "*inflammation of the dermis and mucous membrane, with constitutional symptoms of a specific kind,*" namely, rubeola, scarlatina, variola, varicella, and vaccinia ; the second such as are characterized by "*inflammation of the dermis without constitutional symptoms of a specfiic kind,*" namely, erysipelas, urticaria, roseola, and erythema. This class corresponds in some respects with the order *exanthemata* of Willan, and with the division 'eruptions erythémateuses' of M. Baumès; it differs in including variola, vaccinia, and varicella, which have been classed among vesicular and pustular diseases by those authors. The diseases placed in the first sub-group, constitute pretty nearly Cullen's order exanthemata, whose well-known definition fully expresses their characters, viz. "contagious diseases, attacking a person only once in his life, beginning with fever ; at a definite period eruptions appear, often numerous, small, and scattered over the skin." The cutaneous eruption in these diseases is preceded by the fever, (as expressed in Cullen's definition,) and the constitutional affection is not the consequence of the eruption ; hence several

writers look upon the exanthemata as more properly belonging to diseases of the system than to the division of cutaneous diseases, and upon good grounds, when we find a variety of measles, and one of scarlatina, characterized by being unaccompanied by any cutaneous eruption, as the rubeola and scarlatina, *sine exanthemate*, and for these reasons both M. Gibert and Mr. Plumbe have omitted altogether the consideration of rubeola, scarlatina, variola, and erysipelas in their works on diseases of the skin.

The seat of the inflammatory congestion in the exanthemata, according to Mr. Wilson, " is the vascular rete of the dermis ;" in rubeola, scarlatina, and variola, many of the papillæ of the dermis are also " distended with blood, producing the punctiform appearance of the redness which is characteristic of them ;" and the crescentic form of the congested patches in rubeola depend upon " some unexplained peculiarity in the structure of the dermis, probably having reference to the distribution of the cutaneous nerves." The mottled aspect of the skin of healthy children exposed to cold has the same semilunar tracery; Mr. Wilson observes that, in injecting the limb of an infant with size and vermilion, he could imitate all the forms of redness seen in exanthematous diseases, by ceasing to inject, from time to time ; or by filling the capillaries to their utmost.

The diseases included in the first sub-group, being infectious and contagious, it may be well (Mr. Wilson remarks,) to inquire the precise meaning which we attach to these terms :

" When the transmission is effected by a material substance, and is brought about by actual contact, the term *contagion* (immediate contagion,) is employed ; but when transmission is effected through the agency of the winds, and at a distance, the mode of communication is designated *infection* (mediate contagion). In other words, when the poisonous principle is volatile, and capable of diffusion in the atmosphere, it is infectious; but when this diffusibility is absent, it is simply contagious. In whatever way the poisonous principle be brought to the body of a sound person, and with whatever part it may come in contact, whether with the cutaneous surface with or without abrasion, as in contagion, or with both the cutaneous and mucous surface as in infection, the mode of its reception by the system is the same. In the first instance, it is dissolved in the fluids of the body, and in the second place, is conveyed by imbibition into the circulating current of the blood, thence to act on the nervous system, and alter its functions. Once introduced, the poisonous principle possesses the remarkable power of exciting an action similar to that which existed in the body whence it emanated, the intention of that action being the reproduction of an identical poison." (p. 25.)

Liebig, as Mr. Wilson remarks, has compared the phenomena which succeed the introduction of an animal poison into the blood, to the process of fermentation ; for instance, when a little yeast is added to a fermentable fluid, the action which it excites occasions the formation of abundance of similar yeast ; so the poisonous principle on reaching the blood reacts upon it, and causes the formation of the poison from the constituents of the blood. A remarkable phenomenon connected with these diseases is that they in general occur but once in a person's life, and having once occurred, the system is protected in a great measure against a similar attack. Liebig's theory alone offers any explanation of this curious fact, viz., that we cannot, in a fluid, which has already fermented, excite a fresh fermentation of the same nature ; " it is upon this

principle that safety from a repetition of attacks of eruptive fever reposes," Another point connected with these diseases deserving of remark, is that from the time at which the contagion has been applied, until the disease begins to develop itself, a certain period intervenes (the period of incubation,) which varies in the several diseases belonging to this group: thus in variola, according to Dr. G. Gregory, the period of latency is usually about twelve days; in measles, according to Bateman, from ten to fifteen days; and in scarlatina from four to six days.

We cannot be expected to follow the authors through the characters, symptoms, and diagnosis, of the several varieties of measles and scarlatina, we must be satisfied with giving the following summary and table of the diagnostic characters of the two affections from Mr. Wilson's work:

Scarlatina.	*Rubeola.*
1. Precursory symptoms of one days' duration.	1. Precursory symptoms of three days' duration.
2. Mucous membranes of the eyes, nose, and fauces red and inflamed, without secretion: pain and soreness of throat, no cough; no expectoration.	2. Mucous membrane of the eyes, nose, and fauces red and inflamed, with increased secretion, coryza, sneezing, &c., dry cough at first, subsequently expectoration.
3. Eruption on the second day of the fever; invades the entire surface of the body in three days; disappears by the end of the seventh day.	3. Eruption on the fourth day of the fever, occupies three days in invading the entire surface of the body; disappears by the end of the eighth day.
4. The efflorescence occurs in large irregular patches, or is more or less generally diffused; is of a bright scarlet, compared by Willan to a "boiled lobster," and frequently interspersed with numerous small red papillæ.	4. The efflorescence occurs in small crescentic, and circular patches with intervening unaffected portions of the skin; the colour is darker than in scarlatina, "with nearly the hue of a raspberry," and interspersed with numerous small red papulæ, disposed in clusters.
5. Odour resembling old cheese.	5. Odour sweetish, until the decline of the eruption, then sourish.
6. Principal sequelæ, anasarca, inflammation of the joints, gangrene, chronic bronchitis, ulceration of fauces, conjunctivitis, otitis, abscess of salivary glands, chronic diarrhœa.	6. Principal sequelæ. The same as scarlatina, with the exception of anasarca, inflammation of the joints and gangrene.
7. Exfoliation of the epidermis in laminæ.	7. Exfoliation of the epidermis in furfuraceous scales.
8. Less infectious and contagious than measles.	8. More infectious and contagious than scarlatina.
9. Rarely attacks the same person more than once.	9. Frequently attacks the same person twice.

Treatment. In the milder forms of measles and scarlatina, the treatment should be simply expectant; the disease is the result of the absorption of a morbid poison; it has a certain course to run, and the less the patient is interfered with by the employment of medicine the better; Sydenham indeed remarked of scarlatina " that *none* die of this disease, except from a too great officiousness on the part of the practitioner." The diet should be spare, diluents freely employed, the apartments ought to be kept cool and of an uniform temperature; and there can be no objection to the administration of an emetic of ipecacuanha at the commencement, nor to occasional laxatives of a mild kind (if required,) during its

progress; but the frequent employment of purgatives, or emetics, doses of tartar emetic, (a practice but too common,) "is supported," as Bateman remarks, "neither by experience or principle, and is very likely to do harm." In the more severe forms of these diseases, or when they are complicated with inflammation of internal organs, the treatment must be conducted on general principles; venesection is sometimes necessary, local bleeding more frequently; saline aperients may be employed, but the frequent employment of active purgatives will prove more injurious in this than in the milder forms of the diseases.

Belladonna in small doses was recommended by Hahnemann on homœopathic principles as a prophylactic against scarlatina; we have had no experience of its property in this respect. Dr. Sims (quoted by Mr. Wilson) remarks, in relation to prophylactic treatment, "the best preventive to the disease I found to be rhubarb taken in the quantity of a few grains every morning so as to produce one laxative motion in the day. I did not see one who used it confined afterwards to bed, though several persons began it after they were infected, but before the period of their sickening." MM. Cazenave and Schedel observe that sulphuret of antimony and calomel in combination have been employed (with a similar view) with advantage in the dose of one sixteenth to one eighteenth of a grain of each for a child from two to four years old, repeated several times a day. For protection against the spreading of the contagion of scarlatina or measles, patients recovering from either ought to be secluded from three weeks to a month.

VARIOLA. *Treatment to prevent pitting.* We can only afford room here to notice some of the local means which have been employed to diminish the chance of cicatrices and marks being left by smallpox. This point in the treatment is dwelt upon at some length by Mr. Wilson, but is hardly noticed in Dr. Burgess's Manual, and the practice is discouraged by M. Baumès. To relieve the itching of the face during the suppurating stage various emollient decoctions have been employed. Mr. Wilson recommends the face "to be frequently bathed with an infusion of mallows, or poppy heads, or weak barley-water, and the secretions to be removed by means of a sponge wet with any of these fluids." We prefer as a lotion a very dilute solution of chloride of soda; and the sufferings of the patient are often mitigated by the frequent application (by means of a feather) of the carron oil, long known as a valuable application in recent scalds and burns. In all cases it is essential to prevent the patient from scratching the pustules. It was the practice formerly to open the pustules to squeeze out the pus, and bathe and cleanse the surface with tepid milk and water or some emollient decoction; this plan M. Rayer has always found to be beneficial, and Mr. Wilson considers that it accelerates very materially the healing of the ulcerations, and prevents the formation of deep and disfiguring cicatrices.

It was the practice when smallpox was much more common than it is at present, to exclude the light from the apartment occupied by the patient in order to prevent pitting; the idea seems to have arisen from observing the fact that cicatrices and marks usually occur only upon the face, and part of the surface constantly exposed to the light. So recently as 1832, Dr. Picton of New Orleans (quoted by Mr. Wilson) asserted that in his practice no instance of pitting after smallpox occurred when

the light was shut out. In a discussion at the French Academy of Sciences, (July 4th, 1842,) on the influence of light on the smallpox pustules, M. Serres stated that he had made numerous experiments by covering the pustules with small glass cups, and observed that they were developed, modified in their progress, or completely arrested, according to the degree of transparency of the glass. The same author has remarked (quoted by Mr. Wilson) that he never reaped such successful results in the cure of smallpox as he did at La Pitié during one year, that the patients were placed in a kind of cellar, which was very dark and ill ventilated.

In order to cut short the progress of the eruption, or to arrest its development during the papular or vesicular stage, various ectrotic (from εκτιτρωσκω, to miscarry or render abortive) methods have been employed. MM. Velpeau and Bretonneau proposed cauterization with the nitrate of silver; the apex of the pustules being removed, a sharp pencil of nitrate of silver was inserted into each, or a strong solution introduced by means of a probe; these proceedings give so much pain and are so exceedingly tedious that they cannot often be employed. A solution of nitrate of silver containing a scruple to the ounce of water, and applied over the surface by means of a camel's hair pencil has been sometimes substituted. The application of the solid nitrate of silver is more effectual unless when the solution is employed very early, and even then it scarcely ever checks the progress of the eruption; an ointment composed of two drachms of sulphur to the ounce of lard, applied several times a day by means of slight friction, at an early stage of the disease, has been recommended by Dr. Midivaine, of Ghent, as an ectrotic agent; it has never been tried in this country. More recently mercurial ointments or a plaster containing mercury, as the *emplastrum vigo cum mercurio* of the French pharmacopœia,* have been strongly recommended. They should be applied on the second or at the latest on the third day of the eruption; the whole face is covered with a mask of the plaster, leaving merely a space for the eyes, nostrils, and mouth, or the surface is covered with a layer of the ointment: both are allowed to remain on for three or four days. "The effect," says Mr. Wilson, "is to produce immediate resolution of the eruption, or to arrest it at the papular or vesicular stage; it never becomes purulent, and the skin between the pustules is never inflamed or swollen." According to M. Briquet mercury possesses precisely the same influence over vaccinia as over variola.

Vaccination. Vaccination, although so simple an operation, is not always performed with sufficient care, nor are the conditions requisite for its success always sufficiently attended to; we cannot, however, find space for Mr. Wilson's valuable observations upon this subject, but must refer the reader to the work itself.

EFFUSIVE INFLAMMATION OF THE DERMIS. Under this heading Mr. Wilson considers the cutaneous eruptions, especially characterized by effusion of a serous fluid upon the surface of the dermis, and the consequent elevation of the epidermis in the form of vesicles or blebs. It includes the orders bullæ and vesiculæ of Willan, Rayer, Cazenave and

* This plaster consists of the following ingredients: 95 mercury; 48 balsam of storax; 318 common plaster; 16 of wax, resin, and turpentine, each; 5 of ammoniac, bdellium, olibanum and myrrh, each; 3 saffron; 2 spirit of lavender.

Schedel, and appears to be a natural arrangement of these groups ; indeed, in the original sketch of his classification, Willan had combined those two orders together under one heading, but he was afterwards induced to separate them.   Mr. Wilson makes two divisions of this class : one the *asthenic*, "characterized by diminution of the vital powers of the system ;" the second or *sthenic*, " marked by increased energy of the nervous and vascular systems."   The former comprises pemphigus and rupia, the bullæ of other writers ; the latter contains herpes, eczema, and sudamina, the vesiculæ of other writers.

Bullæ are " elevations of the epidermis caused by the effusion of serum or a sero-purulent fluid under it ;" they have received several names, as blebs, blisters, phlyctenæ, and vary in size from that of a split pea to an orange, " their shape is usually rounded ;" they sometimes assume an acute form, but are more frequently chronic ; and may appear upon any part of the surface, or pass from one part to another.   The bullæ are small at first, but usually attain a considerable size in twenty-four hours ; " at first they are also tense, but when the fluid thickens they become flaccid as if only partially filled ;" after a time they burst, and are succeeded by " excoriations, incrustations, or ulcerations."   Their diagnosis is easy when the disease is at its height, as vesiculæ are always much smaller, and more numerous ; " but when the bullæ have burst, and are succeeded by crusts, the diagnosis becomes one of more difficulty."

Pemphigus.   Both Mr. Wilson and MM. Cazenave and Schedel follow Rayer in regarding the several species of pompholyx as varieties of pemphigus ; and in making two principal subdivisions of the disease, viz. into acute and chronic.   The acute form of pemphigus is a rare disease, principally attacks children, is usually mild and of short duration, and requires but simple treatment ; the pompholyx solitarius and benignus, and the pemphigus vulgaris of Willan are only varieties of it.   Chronic pemphigus (pompholyx diutinus of Willan) is a more frequent and severe affection, occurs usually in old persons whose constitutions are dibilitated or broken down, and is most common in the male ; its appearance is not preceded by fever ; it differs also from the acute form of the disease in the mode of development of the bullæ, which is always successive, and in its long continuance which may be for months.   The structural change in the skin which occurs in pemphigus is precisely similar to that which results from the application of blistering plaster, or boiling water ; indeed, Rayer has related a case where the disease was simulated by the application of powder of cantharides.

The *causes* of pemphigus are not known in some cases, it has appeared to be congenital, in others to be endemic or epidemic ; the acute form usually occurs during the summer, and has been apparently excited by the irritation of teething, excess or change of food, &c.   The chronic form occurs, as before observed, in individuals whose constitutions are injured by intemperance or other causes, sometimes after continued fatigue and anxiety, with poor and scanty food ; " not unfrequently (according to Bateman,) it is connected with anasarca, scurvy, purpura, and other states in which the powers of cutaneous circulation are feeble." Mr. Wilson has seen the disease as a sequela of scarlatina, it is sometimes complicated with prurigo or herpes, more frequently with chronic affections of the viscera ; the condition of the liver known under the name

of fatty liver has been found in individuals dying of this disease. M. Rayer mentions that he and M. Garde tried upon their own persons inoculation, with the contents of the bullæ taken from a case of chronic pemphigus, " but without other effects than such as follow a simple puncture."

The *diagnosis* of pemphigus is easy when the bullæ are distinct and unbroken; if they happen to be small and clustered together, the patches might be mistaken for herpes phlyctenodes, but the bullæ are always larger than the vesicles of herpes, and isolated bullæ presenting their usual characters will be found coexisting. From rupia simplex, pemphigus is distinguished by the bullæ in the former being smaller, flatter, and fewer, also by their terminating in ulceration, and in thick prominent scabs. The scabs of pemphigus have been mistaken for those of ecthyma or impetigo; impetigo, however, is usually confined to a limited surface, and in ecthyma pustules will be observed in some other part of the body.

The *treatment* of acute pemphigus is in general as simple as the disorder is mild; laxatives, diluents, and a cooling vegetable diet are usually alone necessary. In the chronic form of the disease, we must in general have recourse to tonics early, as wine, quinine, and the mineral acids; some prefer the preparations of iron; Mr. Wilson has seen much benefit from the hydriodate of potash. As in many cases the affection is complicated with a disordered condition of some one of the abdominal viscera, our treatment must of course be directed to it. The local treatment consists in puncturing the bullæ, and gently pressing out the fluid. " When the bullæ have burst, and excoriations remain, anodyne and emollient fomentations, weakly astringent lotions, or absorbent powders, (as that of starch,) may be employed with advantage. In these excoriations a solution of nitrate of silver, containing two grains to the ounce will be found the best application. Turner's cerate is also a useful application."

Rupia. This affection was classed among vesicular diseases by Willan and Bateman, but it has been very properly removed to the orders bullæ by Rayer and Biett; it approaches pemphigus in some of its characters, ecthyma or herpes in others. " It may," says Mr. Wilson, " be regarded as a modification of pemphigus developed in cachectic and debilitated constitutions;" and according to MM. Cazenave and Schedel, " it has a great analogy to ecthyma, of which in many cases it appears to be a variety." Rupia is characterized by small, flattened bullæ, which are usually few in number, and isolated; filled with a serous fluid which soon becomes purulent or sanguinolent, succeeded by thick prominent crusts or scabs, which conceal ulcers of a circular form, and greater or less extent and depth. The affection is usually chronic, and the lower extremities are frequently its seat.

Three varieties of rupia are described by most modern writers, viz. R. simplex, R. prominens, and R. escharotica; the beautiful engravings of the two former in Bateman's large work must be familiar to our readers; the latter has been described under several different names, and much confusion has been the result. Under the name pemphigus gangrenosus, Dr. Whitley Stokes, in the Dublin Medical Essays, has given a full description of this disease and its treatment; and as it is rather a

frequent disorder in some places, and is often fatal, we propose to devote a few words to its consideration, more particularly as neither Mr. Wilson nor Dr. Burgess has alluded to Dr. Stokes's communication.

The disease popularly known in Ireland under the name " burnt holes," is not unfrequent in that country among the ill-fed children of the poor. It has been observed as a sequela of measles, scarlatina, fever, and small-pox, and in some instances it appears to have prevailed epidemically. The bullæ have an irregularly oblong shape, are flattened at the top, and the contained fluid soon becomes sanguinolent and finally turbid; they are surrounded by an inflamed border of a livid red colour; when they burst, a gangrenous eschar is exposed, or an ulcerated surface which enlarges rapidly, becomes extremely painful, and is attended with re-markable fetor, very great discharge, and livid edges. The bullæ arise in succession in different places, and the disease continues with little re-mission for ten or twelve days, when the patient dies, worn out by pain, fever, and loss of rest. The disease often makes its first appearance be-hind the ears, then upon the abdomen, inside of the thighs, &c., and is very often fatal; its subjects are weakly emaciated children, usually be-longing to the very poorest class. The treatment of this form of rupia is of a local and general nature. The most important general measures, such as change of air, nutritious diet, wine, &c., are too often beyond the reach of the patient; and quinine or cinchona bark, with the mineral acids, appear to be less efficacious in this than in other affections ac-companied by debility. Dr. Stokes recommended the internal admin-istration of yeast. Anodynes will be almost always found necessary. Among local applications an ointment, composed principally of the fresh leaves of the scrophularia nodosa, had long been a popular remedy in Ireland, and the trials which Dr. Stokes made with it, led him to con-sider it as much superior to any other. On his recommendation and authority the ointment was introduced into the Dublin Pharmacopœia. He recommends a poultice of oatmeal and porter to be laid on the parts for a few hours, and the ointment (previously warmed) to be then ap-plied to the whole ulcerated surface, by means of a feather.

Vesiculæ are small elevations of the surface containing a transparent fluid, formed by the effusion of a little transparent serum under the cuticle, and differing from bullæ merely in size. The fluid is sometimes reabsorbed, and desquamation takes place, at others the vesicles burst, and are succeeded by superficial excoriation, or yellow lamellated incrus-tations. They appear upon every part of the body, are sometimes pre-ceded by general febrile symptoms, are seldom dangerous and never con-tagious.

Willan and Bateman comprise seven genera under this order, viz., varicella, vaccinia, herpes, rupia, miliaria, eczema, and aphtha; Biett admits only five, viz., miliaria, varicella, eczema, herpes, and scabies; Mr. Wilson limits it to three, viz., herpes, eczema, and sudamina. Mr. Wilson has shown that varicella and vaccinia are variolous affections; rupia is generally recognized as a bullous affection; miliaria he treats of as a consequence of disorder of the sudoriparous system; and scabies as an inflammation excited by the presence of parasitic animalcules in-habiting the epidermis.

Herpes. This term was for a long time employed almost as vaguely

as that of " dartre" by the French.   Willan first restricted it to a genus
of vesicular diseases characterized by the eruption of clusters of vesicles
upon an inflamed base, which extends a little beyond the margin of
each cluster, seldom attended by much constitutional disturbance,
though of an acute character; usually preceded by heat, tingling
and sometimes pain; non-contagious; persisting from one week to two
or three, seldom requiring any active treatment, and terminating by ab-
sorption of the contents of the vesicle, " by desiccation without rupture,
or by rupture and the formation of a thin brownish scab, which speedily
falls."

Willan and Bateman describe six species of herpes, and MM. Cazenave
and Schedel follow the same arrangement.   Mr. Wilson classes the
species belonging to this genus in two groups, a phlyctenoid and a cir-
cinnate group, an arrangement which appears to be natural.

" The *phlyctenoid group* is characterized by the irregularity of form, and dis-
tribution of the clusters of which it is composed; it is typified by the variety
herpes phlyctenodes, and embraces all the local forms.   The *circinnate* group
on the other hand is remarkable for the circular arrangement or form of its
clusters : hence the herpes zoster consists of irregular clusters disposed in a
circular form round the trunk; herpes circinnatus (vesicular ringworm) is
characterized by the disposition of individual vesicles in the form of a circle ;
and herpes iris presents the same peculiarity in the form of concentric circles."
(p. 149.)

Suppurative inflammation of the dermis.   Under this title Mr.
Wilson includes the " pustular diseases of the skin," but he limits consi-
derably the number of genera included in this order by other writers.
Pustules are small circumscribed elevations, formed by the effusion of a
purulent fluid between the cuticle and dermis.   " Vesicles, it is true,
at a certain period, contain a thick sero-purulent fluid, but it is alto-
gether consecutive of the transparent serous fluid; while the pustular
eruptions contain true pus from the beginning; besides the physical cha-
racter of this fluid, which is thick and yellow, will readily distinguish it
from the opaque coloured serum which vesicles contain just before their
disappearance."   In addition, pustules usually differ from vesicles in the
depth and intensity of the inflammation which accompanies them.

Pustules were reduced by Willan to two principal or essential forms,
viz. phlyzacia and psydracia.   The phlyzacious pustules (derived from
φλυξειν, to be hot,) are of a large size, have a highly inflamed base, as
the name indicates, and are succeeded by hard, thick, dark-coloured
scabs, as seen in ecthyma. The psydracious pustules (quasi ψυχρα ὑδρακια,
i. e. frigidæ guttulæ,) are of smaller size, " characterized by a less
degree of surrounding inflammation," and by terminating in laminated
scabs; they are seen in impetigo.

The order Pustulæ in Willan's arrangement includes five diseases, viz.
Impetigo, Porrigo, Ecthyma, Variola, and Scabies.   M. Biett's classifi-
cation embraces seven, viz. Variola, Vaccinia, Ecthyma, Impetigo, Acne,
Mentagra, and Porrigo, to which Dr. Burgess has added an eighth,
Equinia, or glanders.   M. Rayer admits as many as ten genera into his
order pustulæ.   Mr. Wilson considers only two diseases under this head,
Impetigo and Ecthyma; he treats of acne and sycosis under " diseases of
the sebaceous glands;" favus (the true porrigo of other writers) under
" diseases of the hairs and hair follicles;" and variola, vaccinia, and va-

ricella under " congestive inflammation of the dermis." In impetigo and ecthyma we have examples of psydracious and phlyzacious pustules, the former are seen in impetigo, the latter in ecthyma.

Impetigo. This disease is characterized by an eruption of small flattened pustules without an inflamed areola, unaccompanied by fever, and non-contagious ; " each pustule attains its full development, and bursts in the course of two or three days, terminating in rough, yellowish, semi-transparent crusts, of considerable thickness. The disease occurs in successive crops, is attended with trifling or no constitutional symptoms, and endures for three or four weeks to as many months or even years." The pustules of impetigo are sometimes collected into clusters, (impetigo figurata Willan;) in others they are more or less scattered, (I. sparsa Willan.) To these two varieties, or a combination of them, the several forms of impetigo described by Willan may be referred, with the exception of I. rodens, " which is rather a cancerous affection than a species of impetigo," and the porrigo larvalis and P. granulata of Willan are now known to be forms of impetigo, and were first described as such by Biett, under the names impetigo larvalis and I. granulata.

Diagnosis. Impetigo of the scalp is sometimes confounded with favus or eczema impetigenodes of this region. From favus it is distinguished by the pustules in the latter being deeply seated in the substance of the skin, and by their rapidly changing into dry yellowish *cup-shaped* scabs ; in addition, favus is a contagious disease, and implicates the hair-bulbs, causing the falling off of the hair, the contrary of which is observed in impetigo. From eczema impetigenodes it is distinguished by the presence of vesicles in the latter, as well as by the form of the crusts or scabs, which are thin and lamellated. Impetigo affecting the chin only has been mistaken for sycosis ; the pustules of sycosis, however, are larger, more raised, less yellow than those of impetigo, and are accompanied by less secretion ; " the crusts of sycosis are darker in colour, not renewed when they fall off, and accompanied by tubercles and indurations." Bateman observes that impetigo in its advanced stages is liable to be mistaken for psoriasis or lepra, " and is in fact daily mistaken for these diseases ;" but a practitioner who could commit such an error of diagnosis must be entirely unacquainted with the characters of the two diseases ; the scaly diseases emit no fluid, and " the very existence of a discharge, however slight, is sufficient to determine the point."

Treatment. We agree with MM. Cazenave and Schedel that the preparations of sulphur have been too generally recommended in impetigo, and that their indiscriminate employment, especially in the early stage, is often decidedly injurious. When the disease is limited, and the local symptoms are mild, emollient and sedative fomentations, the warm bath, vapour bath, or douche, are the best local applications that we can employ, acidulated drinks being at the same time administered internally : general or local bleeding is seldom necessary. " In the treatment of impetigo," Mr. Plumbe well observes, " the frequent removal of the diseased secretion has never been considered of sufficient importance ; the benefit of this step, if carried into effect by frequent ablution of the part with warm water, is incalculable. By this plan, in conjunction with the exhibition of simple alteratives, entirely rejecting anything in the shape of ointments, or other greasy applications, the disease will be often readily

subdued. The part may be kept in a state of moisture at other times, by covering it with oilskin, or by the application of soft linen wetted with the Liq. plumbi acet. dil." The hydrocyanic acid in the form of lotion, combined with alcohol and acetate of lead has been highly recommended by Dr. A. T. Thomson; he observes that he found it to allay the irritation more effectually than any other application; the following is the formula which he employs:

> R   Acidi hydrocyanici .   f. ʒ iv.
> Aquæ distillatæ .   f. ℥ vij.
> Alcoholis   .   f. ʒ iv.
> Acetatis plumbi .   gr. xvij.

M. ft. Lotio.

Mr. Plumbe, in his Practical Treatise, recommends a formula nearly similar, but without the acetate of lead, and observes that "of all external applications he has found none equal in efficacy to it;" he directs the part to be kept constantly covered with pieces of linen wetted with it. M. Rayer, however, observes that lotions composed of sulphuric or nitric acid largely diluted with water are equally efficacious.

In the chronic forms of impetigo, the sulphureous preparations are more decidedly indicated, and may be employed both internally and externally; and the warm bath and vapour douche here will be found valuable adjuncts in restoring the healthy action of the skin. "Should the disease resist these measures, lotions containing sulphuret of potash, nitric acid, or nitrate of silver, may be in turn had recourse to." Creosote ointment, oxide of zinc, acetate of lead, and citrine ointment have been also employed with advantage; and when the disease is limited, a blister applied to the diseased part, as recommended by MM. Cazenave and Schedel, has often proved beneficial. M. Rayer says he has treated very obstinate impetigo successfully by nitric acid, in doses of half a drachm daily in a pint of barley-water, sweetened to the taste; "it very seldom happens that this medicine is continued for a month or six weeks without accomplishing a cure." If all these remedies fail, MM. Cazenave and Schedel observe, we must have recourse to the arsenical preparations, (as Fowler's solution,) which is generally followed by the most surprising effects."

"In impetigo of the hairy scalp, the hair should be cropped over the diseased parts, and the crusts completely removed by means of the vapour douche and water dressings. The parts should be kept free from the irritation of fresh incrustations by frequent washing, and the same remedial measures pursued, as recommended for impetigo in other parts of the body." (Wilson, p. 187.)

Artificial pustular eruptions. It is well known that the application of some inorganic substances to the surface, particularly tartar-emetic, is capable of producing the development of a crop of pustules at the part, resembling in some respects those of variola; and artificial eruptions by means of this substance are usefully excited in a great number of different diseases. The rapidity with which the pustules are developed will depend upon the form in which the tartar-emetic is applied, the fineness or irritability of the skin, &c. It is commonly applied in the form of ointment, and the active ingredient of the ointment contained in the pharmacopœia may be advantageously increased or lessened according to cir-

cumstances. Another method is to sprinkle the powder upon soap-plaster, common adhesive, or Burgundy pitch plaster, and allow it to remain upon the part, by which larger and more painful pustules are generally produced than by the ointment. Dr. Lichtenstein (in a paper quoted by Mr. Wilson,) remarks that limpid lymph taken from the pustules produced by tartar-emetic, and inoculated in a person who has not been vaccinated, produces vesicles which cannot be distinguished from those of vaccinia; and which appear to be equally protective against smallpox with the cowpox; the matter may also be transmitted from person to person in the same manner. The author has inoculated and reinoculated thirty-one persons with the matter procured from this source, and they were protected during an epidemic of smallpox, although placed in association with patients affected with that disease.

Pustules from the inoculation of animal matters. Various animal matters, when applied to the surface for a longer or shorter period, or directly introduced by means of inoculation, are capable also, as is well known, of causing the development of pustules. Variola and syphilis are familiar examples; dissecting wounds are also frequently followed by pustules; and the morbid matter secreted in horses labouring under glanders or farcy may, it is now well known, be communicated to the human subject, and give rise to a very fatal disease. Dr. Burgess, in his translation of MM. Cazenave and Schedel's work, has added to the chapter on pustular diseases an excellent account of glanders and farcy as they occur in the human subject.

Had we not in a recent Number, (vol. XIII. p. 28,) given so full an account of these diseases, both in animals and man, we should have gladly extracted Dr. Burgess's abstract. The reader will find the details very interesting.

DEPOSITIVE INFLAMMATION OF THE DERMIS. Under this title, (selected, he says, only in the absence of a more suitable one,) Mr. Wilson includes diseases characterized by the effusion of plastic lymph into the tissue of one or more of the papillæ of the dermis, constituting a pimple of small size. Mr. Plumbe regards a pimple as formed not by the enlargement of a papilla, but by the escape of a minute quantity of lymph from a distended vessel. This division includes the papular diseases of the skin of other writers, the principal of which are lichen and prurigo.

A papula or pimple is a small, solid, hard, acuminated elevation of the dermis, attended with constant and distressing itching. The number of diseases admitted into this order by Willan was three; Mr. Wilson also admits three, viz. Strophulus, Lichen, and Prurigo; Biett, Rayer, and Gibert reduce the number to two, considering strophulus to be merely a modification of lichen peculiar to newly-born or sucking infants; and Alibert considers them all under a single genus, Prurigo. The diseases included in this order are seldom attended by febrile symptoms, and are usually of a chronic nature; they are non-contagious; none of them are dangerous, and their diagnosis is usually exceedingly easy. The most prominent symptom which accompanies them is itching; they terminate in resolution or more frequently in desquamation.

Strophulus. Mr. Wilson follows Willan and Bateman in making five species of this cutaneous eruption, the distinctions being founded on the appearance, distribution, and colour of the pimples; these are all in-

cluded by Biett under one name, viz. lichen strophulus.   The eruptions referred to the genus strophulus are "better known to mothers and nurses than to the physician," by whom they are variously named tooth-rash, gum, red or white gum ; they are peculiar to infants at the breast, and are often associated with dentition or gastro-intestinal irritation ; they are wholly unattended by danger.

Lichen is characterized by an eruption of minute conical papulæ, which are hard, slightly red, or of the natural colour of the skin, usually occur-ring in clusters, and appearing in single or successive eruptions, occu-pying a particular region or disseminated over the whole surface ; their size is about that of millet seeds, and they are attended by a sensation of tingling or itching ; lichen is sometimes ushered in by febrile symptoms, runs an acute course, and ends in two or three weeks; more frequently it is of a chronic character, and may persist for months or years.

Lichen differs from strophulus by occurring in the adult ; it selects in preference those parts of the surface in which the dermis is thickest, as the back, outer side of the limbs, face, &c.   It appears under several different forms, eight varieties (which have received distinct names) being noticed by Mr. Wilson.   It would far exceed our limits to enter mi-nutely upon the consideration of the characters of the different varieties of lichen ; the following animated description of Lichen tropicus, or *prickly heat*, (given by Dr. James Johnson, in his work on Tropical Cli-mates, from which he was himself a sufferer, and quoted by Mr. Wilson,) may prove interesting :

"The sensations arising from prickly heat are perfectly indescribable, being compounded of pricking, itching, tingling, and many other feelings for which I have no appropriate appellation.   It is usually, but not invariably, accompanied by an eruption of vivid red pimples, not larger in general than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead.   This eruption often disappears in a great measure when we are sit-ting quiet, and the skin is cool ; but no sooner do we use any exercise that brings out perspiration, or swallow any warm or stimulating fluid, as tea, soup, or wine, than the pimples become elevated, so as to be distinctly seen and but too sensibly felt.   This unwelcome guest assails us at all and particularly the most unseasonable hours.   Many a time have I been forced to spring from table and abandon the repast which I had scarcely touched, to writhe about in the open air for a quarter of an hour ; and often have I returned to the charge with no better success against my ignoble opponent.   The night affords no asylum. For some weeks after arriving in India, I seldom could obtain more than an hour's sleep at one time, before I was compelled to quit my couch with no small precipitation, and if there was any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation.   But this was produc-tive of temporary relief only, and what was worse, a more violent paroxysm fre-quently succeeded."   (p. 202.)

Prurigo.   Amongst papular diseases prurigo is perhaps the most for-midable, and certainly the most intractable which we meet in this country ; the variety termed Prurigo senilis is the most frequent, and the difficulty of its cure is almost proverbial.   It occurs commonly in per-sons advanced in life, whose constitutions have been debilitated from any cause ; it is more frequently seen in humble life than in the affluent, and we have observed it several times in individuals who had suffered a reverse of fortune, and from easy circumstances had been exposed to all

the privations of poverty. The disease is so well known that we need not delay to dwell upon its characters or symptoms, but shall confine our observations merely to its treatment.

The treatment of prurigo senilis as laid down in books is for the most part palliative, and is directed either to the alleviation of the itching, (the most troublesome symptom,) or to destroy the pediculi which sometimes accompany this cutaneous eruption ; as tepid baths of salt or fresh water, sulphurous baths, lotions containing acetic acid, corrosive sublimate, sulphuret of potash, muriate of ammonia, &c. ; or lime-water or spirits of turpentine mixed with almond oil ; inunction with mercurial ointment or an ointment containing white hellebore (veratrum album), or muriate of ammonia, or fumigations with cinnabar. Many authors indeed set down this disease as incurable, or nearly so : " the frequent occurrence of this disease in old age, and the difficulty of curing it," Bateman observes, " have been the subject of universal observation." " Prurigo senilis," says Rayer, " sometimes resists the best combined methods of treatment ;" and Biett observes, " this disease is formidable for its obstinacy, and is sometimes incurable." In some instances iodine locally applied has been found serviceable ; Mr. Wilson says " he has used this remedy both as a local and general remedy with good results." " Observing the serious effects that sometimes result from the retrocession of prurigo, I was induced," Mr. Wilson remarks, " to make trial in obstinate cases of a stimulating liniment applied to the skin, after a previous course of tepid baths, and with the most beneficial results. The application which I employ in such cases is croton oil, diluted with oil of almonds, in the proportion of half a drachm or a drachm of the ounce." Mr. Plumbe refers to a very obstinate case of prurigo cured by the following remedies : the papulæ were first touched with lint dipped in undiluted aromatic vinegar, which caused a good deal of pain, the following ointment was then employed :

> Sulphur sublim.
> Picis liquidæ.
> Axung. porcin. āā lb. ss.
> Terræ cretos. ℥iv.
> Hydrosulphuret. ammoniæ ℨij.
> M. Fiat unguentum.

In three days the acid was again applied, and afterwards a solution of nitrate of silver every third or fourth day, previous to the application of the ointment. The internal treatment consisted in the administration of four grains of Plummer's pill at night, and five drops of the arsenical solution three times a day. In less than three weeks the eruption had nearly disappeared, and the itching was entirely removed ; the pills and solution were continued for three weeks longer, during which time a lotion of corrosive sublimate in spirits of wine was applied two or three times a day, instead of the ointment. M. Biett employs the ioduret of sulphur in the form of ointment in prurigo senilis ; the following is his formula :

> ℞. Ioduret. sulphuris, gr. xx-xxx.
> Axung. unciam.
> M. Fiat unguentum.

Alibert recommended the following ointment in this disease :

> R.   Tinct. opii.
>   Sulphur. sublim. āā ℥ss.
>   Oxidi zinc.
>   Ol. amygdal. āā ℥j.
>   Adipis. ℥iij.   M.

We have derived more benefit from the local application of creosote in this troublesome affection than from any other remedy. The creosote may be employed in the form of ointment or lotion or both combined.   The proportion of creosote contained in the ointment is from eight to sixteen drops to the ounce of lard; in the lotion half a drachm of creosote to eight ounces of water, to which a little acetic acid or spirits of wine is added to render it soluble in the water.   The ointment should be freely rubbed upon the parts at night, and the lotion applied the following morning, and repeated during the day; the itching is very speedily removed, and the disease by perseverance in the remedies for a short time subsides; the previous employment of the warm bath is generally advisable, and in all cases the linen should be frequently changed.   At the same time the general health must be attended to; the occasional administration of a combination of purgatives with a tonic will be found useful; all stimulating articles of food must be prohibited.

SQUAMOUS INFLAMMATION OF THE DERMIS.   Under this designation Mr. Wilson includes a class of diseases characterized by inflammation of the dermis, and by the production of abnormal epidermis in the form of thin laminæ or scabs : these are the scaly diseases of other writers, and they belong to the division of Mr. Plumbe, entitled "diseases chiefly marked by chronic inflammation of the vessels secreting the cuticle, producing morbid growth of this structure."

The scaly diseases of the skin are characterized by the formation of inorganic laminated scales of morbid cuticle (*squamæ*), of a whitish colour, opaque, dry, friable, and more or less adherent ; they are elevated above the rest of the skin, and then thrown off; the skin appears red and inflamed, and they are speedily reproduced.   The eruption commences with red, slightly elevated, and distinct spots or patches, which sometimes remain distinct, at others coalesce, and upon which squamæ are soon formed.   The commencement of the eruption " is rarely attended with constitutional disturbance ; indeed, the patient is frequently not aware of the existence of the disease until the patches are fully formed, or the cuticle is on the point of being detached."   The only constitutional symptoms which accompany them are a slight degree of heat and itching ; they are not contagious, occur generally in adults, and are more frequently seen in the female than the male; they are not dangerous, but are usually exceedingly tedious and difficult to cure.   The diagnosis of the scaly diseases of the skin is generally easy, the laminated scales which they present are sufficient to distinguish them from every other cutaneous eruption; in addition the scaly diseases (as remarked by Bateman,) emit no fluid, and the presence of a discharge, however slight, is sufficient to determine the point.

The order Squamæ in Willan's arrangement includes four diseases, viz., lepra, psoriasis, pityriasis, and icthyosis; the latter which bears no analogy to the others has been very properly removed from this order by

Rayer and Mr. Wilson, although still associated with it by Biett and MM. Cazenave and Schedel.

Lepra and *psoriasis* are the type of the scaly diseases of the skin : both commence in small papular looking elevations of the surface, which soon become covered with a laminated scale, of a white silvery appearance. " These elevations unite, and then change into scaly patches, of various forms and dimensions, which may either be in small numbers, and limited to a single region of the body, or occur disseminated over the whole surface. In the latter case the desquamation is frequently so copious that the bed and clothes of the patient become filled with dry whitish-looking scales." The eruption most frequently commences on the extremities, particularly the neighbourhood of the knee and elbow, from which it extends to the body generally. It is usually stated that the scalp is not often attacked ; but when the eruption is general over the body, we have found the scalp to be more or less engaged. Lepra and psoriasis have so many characters in common, and so much analogy with each other, that several writers upon cutaneous diseases include both under one head, considering them to be merely varieties of the same affection ; and we have no doubt this is the correct view to take ; for instance, the two diseases not unfrequently complicate one another ; we have seen them combined, and again passing into each other, so as to lead to considerable difficulty in the diagnosis. We seldom or never find them combined with other forms of cutaneous eruptions ; they are both of a chronic nature, rebellious to treatment, and often very difficult to cure ; and lastly the treatment found to be effectual in relieving the one is usually successful also against the other.

" If any useful purpose were to be gained by their reunion," Mr. Wilson observes, " I would cheerfully record my vote in its favour, for the similarity of lepra and psoriasis in their essential nature is so complete, as to render them almost identical. On the other hand, it may be fairly advanced, that the terms are so well understood, that no error can arise out of their separate existence ; that time has rendered them classic sounds, which could not well be dispensed with ; and moreover that certain differences of moment are admitted between them, such as extent of surface occupied, duration and severity." (p. 213.)

Treatment. The treatment of lepra and psoriasis is essentially the same ; the latter disease is however in general the most obstinate ; both local and constitutional remedies are usually necessary, the former when employed alone, always (as Biett observes,) proving ineffectual, and often not only useless but injurious. The majority of cases of these diseases are unattended at any period by active inflammation or much irritability of the surface, hence it is seldom necessary to resort to bloodletting, or the antiphlogistic regimen ; though in recent cases, and " where the disease pursues an acute course" MM. Cazenave and Schedel observe they may be required ; such cases, however, must be very rare.

The local remedies are warm sulphureous or salt-water baths, and the vapour bath, which, according to M. Biett, excels all the others ; sulphur fumigations are more efficacious in psoriasis than lepra ; towards the decline of the eruption an ointment of the ioduret of sulphur, in the proportion of twenty or thirty grains to the ounce of lard, is frequently used at the hospital of St. Louis with the best effects. M. Gibert employs an ointment of *fuligokali* (a compound of soot and potash) in the proportion

of twenty or thirty grains to the ounce of lard; and Mr. Wilson says he has used this substance in local psoriasis with better success than he had obtained by the usual remedies.   M. Lemery applies naphthaline in the form of ointment to the diseased surface on folds of linen: his ointment consists of two to four parts naphthaline to thirty parts of lard; several other forms of ointment are also occasionally resorted to, and the white precipitate, oxide of zinc, or citrine ointment.   Mr. Plumbe states that he has derived much benefit from the following ointment in lepra, lupus, and several other obstinate cutaneous affections; "its composition," he adds, "may not perhaps bear the test of chemical criticism, but as remedies are estimated by their useful effects, this is of no importance :"

> ℞ Hydrargyri submuriatis.
>   Plumbi superacetatis   -   āā ℥ss
>   Unguent. hydrarg. nit.
>   ———— cetacei   -   -   āā ℥ij
>
> M. Fiat unguentum.

External remedies alone, as already observed, are not competent to remove these diseases, and ought not to be persevered in too long.   The internal remedies which have been recommended in these diseases are very numerous, but, as Bateman observes, "there is no one remedy, nor any invariable plan of treatment which will succeed in every instance, and under all circumstances."   The remedies advocated by the highest authorities, and whose value has been most frequently tested, are the preparations of arsenic, mercury, and iodine, or combinations of them; tincture of cantharides, dulcamara, sarsaparilla, and purgatives.   "The result of M. Biett's experience at the Hospital of St. Louis goes to prove that the most successful internal remedy consists in the exhibition of purgatives, tincture of cantharides, and the different preparations of arsenic." Purgatives are only serviceable when the disease is recent, of limited extent, and affects young persons.   "The tincture of cantharides administered internally in some mucilaginous drink, in doses gradually increased from five to twenty or thirty drops several times a day, occasionally," says Rayer, "causes the rapid disappearance of the disease, especially when it is limited, and not very severe in its character."   MM. Cazenave and Schedel consider this medicine more useful in cases where the disease has reappeared, or is diffused, or where it has resisted the action of purgatives, and occurs in subjects of a soft and lymphatic constitution; "it generally effects a cure in the course of forty-five to fifty days, especially in females."   They mention a case of lepra of eighteen years' standing, treated at St. Louis, by this medicine, in which the eruption disappeared in the course of a month.   The objections to the employment of tincture of cantharides are its liability to excite strangury, and its tendency to derange the digestive organs; on which account we are often obliged to intermit its use, or sometimes to give it up altogether: it does not appear to be quite so effectual in psoriasis as in lepra, and it usually succeeds better in the cases of females than in males.

The preparation of arsenic ordinarily employed, and perhaps the best, is Fowler's solution.   We may commence with a dose of two or three drops twice or three times a day, and gradually and cautiously increase it to ten or twelve drops; it may be administered in a decoction of dulcamara, sarsaparilla, or cinchona; and it must be persevered in regu-

larly, frequently for two or three months; it often at first increases the redness and heat; and its effects require to be carefully watched; if it produces a sensation of stiffness or tension of the eyelids, pricking in the throat, puffiness of the face, thirst, redness of the tip and edges of the tongue, or pain at the epigastrium, it must be immediately discontinued. Dr. A. T. Thomson prefers the iodide of arsenic to Fowler's solution, in doses of one tenth of a grain; he also recommends the biniodide of mercury, in combination with opium or conium, in doses of from one sixth to one fourth of a grain, and in obstinate cases he combines it with the iodide of arsenic. More recently Mr. Donovan of Dublin has introduced a combination of arsenic, iodine, and mercury, to the notice of the profession, under the name " Liquor hydriodatis arsenici et hydrargyri," which has been found very serviceable in cases of psoriasis and lepra; each drachm of this solution contains one eighth of a grain of protoxide of arsenic, one fourth of a grain of protoxide of mercury, and four fifths of a grain of iodine converted into hydriodic acid. The dose is half a fluid drachm three times a day, for an adult. Several other remedies have been recommended in these diseases : Biett states he has not found " the decoction of dulcamara of much use; tar and pitch have invariably failed with him; and sarsaparilla, mezereon, and white hellebore are very uncertain."

INFLAMMATION OF THE DERMIS INDUCED BY PARASITIC ANIMALCULES INHABITING THE EPIDERMIS. This is the title of the eighth chapter of Mr. Wilson's work. It contains but a single disease, *scabies*, which by most writers is referred to the order vesiculæ, and by Willan was erroneously placed among pustular diseases. Mr. Wilson looks upon the presence of the *acarus scabiei* as a necessary feature in the diagnosis of the disease.

" When one of the *early* vesicles of scabies is examined with attention, a minute spot or streak may be observed upon some one point of its surface. This is the aperture originally made by the insect on its first entrance beneath the epidermis, and from this spot or streak a whitish line may be traced, either in a straight or curved direction, into the neighbouring epidermis. The whitish line is the *cuniculus* or burrow of the acarus; it necessarily varies in length, being sometimes as much as five or six lines in extent, and at its termination, under a slight elevation of the epidermis, the little inhabitant lies concealed. The acarus may be easily distinguished by the experienced eye as a small dark point at the end of the cuniculus, and if a thin capsule of epidermis be raised in this situation with the point of a needle, the little creature is brought into view. . . . There is no communication between the vesicle and the cuniculus, and the acarus is never situated within the vesicle or pustule." (p. 239.)

" The existence of the acarus scabiei is without question; I have extracted as many as twenty at a single sitting. I have placed them on a slide of glass and seen them run; and after the business of the day has been over, I have examined them with the microscope, and found them still active. When examined with the naked eye, the acarus looks white and shining, globular in its form, and very aptly resembling the little bladder of water of bonomo. There is no difficulty in extracting it; the cuniculus is seen without difficulty; the end of the cuniculus is perceived to be a little raised; as soon as this little eminence of epidermis is lifted, if the end of the needle or pin be examined, the minute, white, shining globe will probably be observed attached to the instrument. . . . . This facility of extracting the animal is due, in a great measure, to its power of clinging by means of a special apparatus which it possesses." (p. 381 et seq.)

Mr. Wilson regards the acarus scabiei as " the unique cause of scabies,

and as a necessary feature in the diagnosis of the disease." The animal is transferred by the infected to those who are sound by actual contact; in some cases the adult acarus, in others " ova or embryos suspended in the fluid of the vesicles may be the mode of transmission."   " Certain it is," he adds, " the application of one of these animalcules to the skin of a sound person will give rise to the disease." Mr. Wilson then relates a series of experiments performed by Mr. Albin Gras, a pupil at St. Louis, published by that gentleman in a short memoir on the subject, in the year 1834, two of which we give in the author's words.

" I lately placed nine acari in the bend of my left arm, and retained them there by a compress and bandage. Four hours after, I felt considerable pruritus, and next day perceived four cuniculi. Several days after, some vesicles showed themselves on my forearm. Having placed two acari in the flexure of the elbow of two persons, who expressed their willingness to submit to my experiments; on one, three or four vesicles were apparent on the fifth day; and were accompanied by severe itching. On the other, there were two cuniculi, with pruritus, but no vesicles." (p. 224.)

In connexion with parasitic animalcules, we may here allude to another which has been recently found to inhabit the sebaceous follicles of which Mr. Wilson has given a figure and description.   In his researches to discover the cause of acne, Dr. Simon, of Berlin, made the discovery of this animal, to which he has given the name " *acarus folliculorum ;*" it is found imbedded in the sebaceous matter near the orifice of the follicle, the head being directed inwards.   These animalcules are tardy in their movements, and retain their vitality for a considerable time : thus M. Simon found them alive after ten or twelve hours' confinement between two plates of glass; and in one instance they were found alive in a subject dead for six days.

" After perusing the account of the acarus folliculorum given by Dr. Simon, I determined (says Mr. Wilson,) to proceed to a verification of his discoveries. I was not long in obtaining subjects, almost every face that I met supplied me with abundance ; and the difficulty seems to be, not to find the creature, but to find any individual, with the exception of newly-born children, in whom they do not exist.... almost every collection of sebaceous matter which can be squeezed from the numberless cutaneous apertures upon the nose, forehead, face, &c., will furnish subjects, and as the parasites are situated near the mouth of the follicle, that portion which is squeezed out with the least force is the part most likely to be inhabited by the acarus. The acarus folliculorum would seem to give rise to no uncomfortable effects by its presence, unless perchance it should multiply to such an extent as to become a source of irritation to the follicle...
..These animalcules undoubtedly feed on the sebaceous substance in which they lie imbedded, and which is the cause of their existence. I have commonly found two in the small mass of this substance expressed by the fingers, often four and five, and in one instance eight closely connected together." (p. 389.)

With these quotations our limits oblige us to conclude the notice of the volumes before us. Much important matter still remains to which we would gladly have referred, particularly the chapters on syphilitic eruptions, molluscum, favus, acne, &c. In our observation we have been constrained by the great variety and extent of the subjects to make our review rather an abstract of the most important points connected with the diagnosis and treatment of a few diseases ; and our opinion of the comparative merits of the three treatises may be gathered in some measure from the number of references we have made to the opinions advanced or to the descriptions given in each work.

Mr. Wilson's volume contains an excellent digest of the actual amount of knowledge of cutaneous diseases; it includes almost every fact or opinion of importance connected with the anatomy and pathology of the skin; and, taken as a whole, is very creditable to him.   Of the Manual of Diseases of the Skin, translated by Dr. Burgess, it is hardly necessary to give an opinion; the original has been in the hands of the profession for several years, and has received the most unequivocal stamp of its approbation, by several editions having been called for during that period. We shall only add, that the translation is well and faithfully executed, and the additional matter supplied by Dr. Burgess increases considerably its utility.   M. Baumès' treatise, though containing more than double the number of pages of either of the former works, has little to recommend it; its arrangement (as we have already observed) is faulty; the style is too diffuse; and the facts and observations of value which it necessarily contains, are so mixed up with and obscured by his theory, that, in the majority of instances, it is difficult to arrive at them.

Art. VIII.

1. *Heelkundige Mengelingen.*   Door J. F. Kerst, Chirurgiæ Doctor, &c.—*Utrecht*, 1835.   8vo, pp. 256.   Met Platen.
Surgical Miscellanies.   By J. F. Kerst, Doctor of Surgery, &c.— *Utrecht*, 1835.   With Plates.
2. *Klinische Bijdragen tot de Theorie en Praktijk der Genees en Heelkunde.*   Door C. Gobee, Med. en Chir. Doctor.—*Utrecht*, 1839. 8vo, pp. 320.   Met twaalf Tabellen en eene Plaat.
Clinical Contributions to the Theory and Practice of Medicine and Surgery.   By C. Gobee, Doctor of Medicine and Surgery.—*Utrecht*, 1839.   With twelve tables and a plate.

Although these works have been published some years, they were unknown to us until very recently; and we doubt not they will be new to nearly all our readers in this country.   Dutch is so little read by foreigners that authors writing in that language are more likely to be overlooked than the writers of any other nation, save by the small circle of their countrymen.   For this reason we have endeavoured, to the best of our power, to make known to our readers the most esteemed works that have reached us from Holland; and it will always be a gratification to us to be able to prove to the eminent men of that country how highly we appreciate their honorable character, and their important labours in the field of medical science.   On the present occasion, we think that the best purpose, for both authors and readers, to which we can use the works now before us, consisting chiefly of miscellaneous observations, is to extract those parts from them which possess the most interest.

I. The first chapter of Dr. Kerst's book is occupied by a report of the most important events in the Royal Military Hospital of Instruction at Utrecht during 1830, and parts of 1831 and 1834.   He describes (p. 5) a preparation of a *remarkable case of necrosis of the sternum,* from an adult man.   The whole manubrium has perished, and in its place there is a sac of the same form, but larger.   The walls of the sac are chiefly membranous, as if formed by the persistent periosteum, but they have several isolated plates of bone, tough and newly formed, adhering to their

internal surface : the posterior wall is flat, the anterior is arched and per-
forated by six apertures. The sac contains three loose, spongy sequestra.
The cartilages of the upper ribs are firmly attached to its sides, and its
walls seemed to be continued into the periosteum of the clavicle, the
fibrous membrane thus prolonged being all that remains in the place of
the sterno-clavicular articulation.

A case is related (p. 29) of *excision of the external malleolus.* The
patient was a soldier, twenty-two years old, in whom chronic ulceration
of the lower extremity of the fibula ensued in consequence of a sprain.
The disease had existed fourteen months, and his health was much im-
paired.   The skin over the outer ancle was thick, hard, and painful, and
there was a constant slight discharge from an aperture which led into the
substance of the fibula.   Having cleared the malleolus from the soft
parts over it and by its sides, Dr. K. tried to work a small chain-saw be-
tween the fibula and tibia ; but, as there was not room enough for this,
he employed a trephine, and cut out a piece of the fibula.   He then
opened the joint, and by raising the bone as much as possible with a spa-
tula, he divided all the ligaments and completed the removal of the dis-
eased portion.   Severe inflammation of the parts ensued soon after the
operation, and when this was subdued abscesses formed in the sole of the
foot ; but, at length, a cure was established, and the patient left the hos-
pital with a useful though partially anchylosed joint.

To this succeeds a case (p. 35) of removal of the os cuboides, with the
last two metatarsal bones and toes, which were all carious.   In three
months the patient had recovered, with perfect mobility of all the remain-
ing joints, and could walk very well without a stick.

The next case (p. 40) is one of a lad seventeen years old, who, two
years previously, fractured his skull to such an extent that ten applica-
tions of the trephine were thought necessary.   A portion of his left pa-
rietal bone, about four inches square, was thus removed ; but he quickly
recovered, with the exception of a paralysis of the right side, and this also
gradually disappeared.   Many observations were made upon the state of
his brain, which was covered only by the cicatrix of skin and dura mater.
Respiration seemed to have no influence at all upon it.   Pressure on the
cicatrix, to the full extent to which it would yield, produced no effect.
But, which is most remarkable, the centre of the cicatrix where the bone
was deficient, was always level with the surrounding surface of the skin
in the morning, but in the course of the day it gradually fell to about an
inch (Rhenish) below that level, and rose again in the course of the night.
The patient himself had no consciousness of this change.

As an appendix to the first chapter, Dr. Kerst adds some " brief notes."
One relates to a patient who had always enjoyed good health, till inflam-
mation, with ulceration of the ancle-joint, occurred in consequence of a
sprain, and required the removal of the leg.   While the stump was heal-
ing, a comrade, bidding him "good bye," shook him heartily by the
hand, and, slight as the force was, it brought on immediately an acute
inflammation of the wrist, with disease of the carpal bones, and, in spite
of all treatment, the poor fellow had to lose his fore-arm.   The stump
healed very well by the second intention, but in less than a year he died
of phthisis, with caries of the upper dorsal vertebræ.   Another brief note
tells of a soldier who suffered from disease of the hip-joint, and in whom
sloughing from pressure in lying destroyed the whole coccyx : yet, when
he recovered, he was as well able as ever to discharge and retain his fæces.

The second chapter comprises a report of what occurred in the surgical department of the military hospital at Antwerp, during the bombardment in September and October, 1830. It is almost exclusively occupied with gunshot wounds, and contains its full share of marvellous courses, flattenings and splittings of bullets, and the other singularities of such accidents. Among them a case is mentioned in which a shot passed through the head of the tibia without splitting it, and the patient did well, without amputation.   Others are related which make it probable that longitudinal fissures of bones occur only when the balls strike obliquely, and that they always follow the same direction as that in which the ball was moving.

The following are the most remarkable of the cases related in this chapter.   A man received a gun-shot wound which exposed two inches of the right parietal bone.   There was no appearance of fracture, but he had severe headach: on the following morning he became comatose, and soon died.   On examination, the outer table of the bone was found entire, and was not depressed: the inner table was fractured to the same extent as the outer was exposed, and the broken portions were pressed deeply in upon the brain, and had excited acute inflammation of its membranes.

A soldier had his hand shattered by the accidental discharge of a gun loaded only with powder.   He instantly fell senseless; but in four hours he came to himself, and had great pain in the arm with inability to move it.   In two hours more the whole limb became insensible, and one of his fingers was removed without his feeling it.   There were no signs of affection of the brain, except a dilatation of the left pupil.   The paralysis of the arm continued complete for a long time; and the author ascribes it to concussion of the brachial plexus.

Four amputations at the shoulder-joint were performed by La Faye's method slightly modified, and all were successful.   The thigh was amputated at the hip-joint twice.   The first patient was excessively reduced by long-standing necrosis of the femur, and died three hours after the operation.   The second had a gun-shot wound; secondary amputation high up was being performed, when the bone was found to be splintered nearly as far as the joint.   Incisions were therefore carried up from the circular incisions already made, and the head of the bone was removed.   This patient, like the first, died as if from the shock of the operation, which he survived only forty-eight hours.

The following points in Dr. Kerst's treatment of gun-shot wounds, which in general is very simple and judicious, deserve notice.   He is very favorable to the employment of general bleeding, whenever robust patients have not lost much blood from their wounds; and after the general bleeding, but not unless it has first been employed, he uses local bloodletting.   In wounds implicating important organs he abstracts very large quantities of blood; in many cases, as much as from 50 to 100 ounces in a few days from the arm, and whatever 300 or 400 leeches will draw from the wounded part; his rule being, to go on with the bleeding, as long as the pulse is above its natural strength, and till the usual period of inflammation is past.

With respect to amputations, he found the rules laid down by English surgeons, to be generally correct, though he managed to save some limbs which, had he strictly acted up to those rules, he must have

condemned. It is to be remembered, however, that he was practising in a town, not in the field, nor in a moving army. Perhaps to the same circumstance may be referred the fact, that his secondary amputations had more favorable results than his primary ones. Of 36 amputations of large members, 16 were performed within the first twenty-four hours, and 20 at later periods; of the former he lost 8 or one half (two by hospital-gangrene); of the latter, only 4 or one fifth, and among these 20 were the four amputations at the shoulder-joint.

The treatment after operations was of the simplest kind. He began his practice at Antwerp, by trying in all cases to obtain union by the first intention; but he found that the attempt was so rarely successful and so often productive of inconvenience, that he soon gave it up and adopted a kind of middle course which proved much more advantageous. He covered the wound with linen, spread with some simple ointment, and a small quantity of soft charpie, then, with strips of plaster, brought its edges within about an inch of each other, and applied a layer of lint and a bandage upon the stump. This dressing was repeated till the wound was healed, or else, if all seemed going on well, the edges were brought together on the 3d or 4th day, and allowed to unite. In amputations of the thigh, the stump was always carefully bandaged, to prevent the too great retraction of the muscles; and only two cases of conical stumps occurred.

In the third chapter of the work, which contains a report of the chief events during Dr. Kerst's service in the field, there are but few cases of interest. The most remarkable is one of *dislocation of the humerus upwards and backwards:* a direction which it has not before been observed to have taken. It occurred to a surgeon, who fell from his horse with his left arm under his body. The swelling was so great when he was first examined that no dislocation could be detected. The only signs that indicated one were, that the left elbow was somewhat higher and more forward than the right, and that the motions of the arm backwards and outwards were limited and very painful. On the fifth day, the swelling being reduced, the head of the humerus was felt on a level with the acromion, and resting against its posterior margin. It was, with some difficulty, reduced by drawing the arm forwards and downwards; a distinct crack was heard, the patient himself seemed to feel the head of the bone pass into the glenoid cavity, and all the natural motions of the arm were restored, though they continued painful.

The only other accident that could have produced these symptoms is the dislocation of the long tendon of the biceps muscle; and, on the whole, we think it is more likely that this had occurred than that so strange a displacement of the humerus had taken place.

II. The chief end which Dr. Gobee has had in view in his work is, to give his cases—miscellaneous as they are—more value than those have which are published in an isolated form, by arranging them in their relation to atmospheric and other external circumstances. He has acted on the aphorism of Baglivi, " unicuique enim regioni sua est medicina, sua methodus," and has placed side by side with his tables of diseases occurring in each month—a complete meteorological table. In an hospital of less than 100 beds, it is of course impossible to draw from one year's ex-

perience any definite rules of atmospheric influence upon disease ; but to those who are collecting statistics on the subject Dr. Gobee's work, from its completeness as far as it goes, and its accuracy, may be of great value.   For the present we can only make the same use of it as of Dr. Kerst's.

Having described (p. 4,) a case of hemicrania, which was aggravated every night, and which he cured by sulphate of quina with opium, he says that this affords no proof that the pain was due to a latent intermittent fever ; and adds, that for the last two years he has found the same treatment highly beneficial for the nocturnal pains of rheumatic ophthalmia.   Whenever the eye has, with the exception of the redness and lachrymation, been pretty well through the day, and the boring pain comes on severely in the evening or at night, he orders, instead of local bleedings, two grains of quinine with a third of a grain of opium, to be taken every hour.   The pain usually returns in but a slight degree next night, and the cure is sure to be completed by giving eight or ten grains of quinine, with a grain of opium on the next day.

Two cases of young soldiers are related (p. 83,) in which tartar emetic was used with evident benefit in well-marked delirium tremens, from hard drink.   A grain was given every hour in water for about eight times.   Stimulants were not administered.

The most singular fact in the book is the occurrence of four cases of acute inflammation of the spinal cord, two, at least, of which were so well marked that they deserve to be extracted.   The first (p. 8,) occurred in a soldier, twenty-four years old, convalescent from slight inflammation of the fauces.   One morning, having been as well as usual all the preceding day, Dr. Gobee found him with erysipelas of the nose and cheeks, and complaining of pain in the lower jaw, "but chiefly of a burning and quite intolerable pain in the loins.   In examining the spine," says the author, " he shrieked out with pain when I came upon the first lumbar vertebra.   The pain was fixed to one and the same place, and did not shift in the least.   Before, during, and after the examination he had *shocks* which put the whole trunk in motion, returned every two or three minutes, and could only be compared with those from electricity or from strychnine."   Sometimes the trunk only was thus affected.   The patient's speech was difficult and indistinct, his tongue was dry, he had severe thirst, but could swallow without pain ; his respiration was natural, his pulse small and a little accelerated.   Dr. Gobee, diagnosticating *myelitis*, ordered him to be cupped largely over the loins, to be put directly afterwards in a warm-bath, and to take twelve grains of calomel in six doses at short intervals.   These produced no relief, and shortly afterwards he was again cupped, with some advantage ; but the shocks continued.   In the afternoon, however, there was no amendment ; the pain in the loins and sacrum was excessive, and the shocks continually recurred, but the mind was undisturbed.   All that night was passed without sleep, but there was no delirium.   In the morning the erysipelas had spread over the face.   The shocks still continued, and he complained of pain when either the limbs or the body was touched.   His general condition was the same.   A grain of calomel having been given every hour during the night, small and frequent doses of tartar emetic were now administered, and he was put again in the warm bath.   The latter produced relief of

the pain and the shocks, but the erysipelas continued to spread, and he grew very weak. On the second night of his illness he was quiet and next day he had but little pain in the back, and the shocks were less frequent; touching the limbs was painful, and they were stiff and bent, so that the forearm could hardly be straightened. On the fourth day all had gone ill; he had been delirious and violent all night, he passed his urine and fæces involuntarily, and his pulse was very small. In the afternoon he was paraplegic, all night he was shrieking, and at noon next day he died. After death the cerebral and spinal dura mater was found very red, partly from the fulness of its own blood-vessels, and partly from the pia mater being seen through it.

"The injection of the latter was so great that over its whole surface, from the cerebrum to the extremity of the spinal marrow, not a spot could be found without excessively distended capillaries. Between the arachnoid and the brain and spinal marrow there was neither serum nor any morbid appearance. The colour and consistence of the surface of the brain were natural, so were the choroid plexuses, the corpora quadrigemina, and the thalami optici, but the corpora striata and the cerebellum were very soft. The medulla oblongata, as well as the cervical and dorsal portions of the cord were natural; but from the lowest dorsal vertebra to the cauda equina the softening was such that the spinal marrow, during examination, remained like pulp upon the fingers, and had lost its organic structure. Its colour was yellower at this than in the healthy part. No pus was to be found. All the other organs were healthy."

The second patient was a soldier, twenty years old, of weakly habit, who was admitted with severe pain in the head, especially in the supra-orbital region, which he ascribed to cold. There was no general disorder, and he was treated by purgatives, and, when these produced no good effect, by free local bleeding, warm baths, and tartar emetic: but they were all unavailing, he got no rest, and became melancholy. The pain in the right brow, and the snapping of the eye and intolerance of light which had speedily supervened on it, continued; but there was still no general disturbance. On the ninth night, however, there was a sudden change: he became delirious and violent, and passed his fæces involuntarily. In the morning he looked wild, and his pupils were dilated: his pulse was 120, and small; and his skin was dry. While in a warm bath, cold water was poured in a small stream upon his head for 15 minutes, and he was afterwards wrapped up very warmly. In the evening he was better, and he remained quiet all night. On the twelfth morning, however, he was talking to himself, continually, and he complained of severe pain when the eyelids were touched. He passed the day talking and singing, and in the evening a small quantity of morphia was given. It produced three hours' sleep, but he passed all the rest of the night in singing. Next day, the 14th of his illness, he was in a similar state, continually singing; but he now shrieked as if from pain, when his abdomen, and especially the inguinal region, was touched. He was now also much emaciated, though he had not been severely treated, his evacuations passed involuntarily, and his pulse was very small. From this state there was little change till he died; he had one short lucid interval, but he gradually sunk, and the excessive sensibility increased and extended, so that for two days before his death he shrieked when any part of the limbs or abdomen was touched. He died on the 17th day, and his body was examined thirty hours after,—the weather being very cold.

A large quantity of serous fluid was found between the membranes of the brain. The pia mater was very red and, at the ninth and tenth dorsal vertebræ, was covered with vascular patches. The gray substance of the brain was discoloured and yellowish: at the base there was a greenish transparent jelly-like false membrane in the tissue of the arachnoid. On the chiasma the arachnoid was very thick, and had on it a tuberculous body of the size of a pea which had probably pressed on the optic nerve and the first branch of the fifth pair. The surface of the hemispheres, the cerebellum, corpus callosum, fornix, corpora quadrigemina, thalami, corpora striata, and the spinal marrow, from the medulla oblongata to the cauda equina, were reduced to a pulpy consistence, so that the finger could be passed through them with scarcely the least resistance. The difference between the white and gray substances of the cord was also indiscernible, for it had all one whitish-yellow pulpy appearance. There were two ounces of bloody serum in the right lateral ventricle. The other organs were healthy.

The third case was less distinctly marked, and more complicated: the fourth was more chronic in its progress: but both tend to confirm the conclusions which the author draws from the first two; namely, that *shocks* of the trunk, like those produced by electricity, or by strychnine, are pathognomonic of the acute stage of inflammation of the cord, and that the exaggerated sensibility of the body, and the expression of pain, when any part of it is touched, appear to be as good indications of the softening having taken place.

The last fifty pages of Dr. Gobee's work are devoted to an essay on the ophthalmia of the Netherlands army, but this is too much a peculiar subject for consideration at present. The extracts which we have given include all that has particular interest; and as the authors of these works are both men of renown in their own land, they may serve to give some idea of the state and style of practice in Holland. It seems to be simple, guided by common sense, and plain, calm judgment, and is, if we may so speak, more *English* than that in any other country on the continent.

ART. IX.

1. *The Simple Treatment of Disease; deduced from the methods of Expectancy and Revulsion.* By JAMES M. GULLY, M.D.—*London*, 1842. 12mo, pp. 128.

2. *Beiträge zur wissenschaftlichen Heilkunde.* Von Dr. C. A. W. RICHTER.—*Leipzic*, 1842. 8vo, pp. 271.
  Contributions to Scientific Medicine. By Dr. C. A. W. RICHTER.— *Leipzic*, 1842.

THESE two works, though dissimilar in title, have a general correspondence in subject and object. We therefore class them together, under one head, for the sake of comparison. We shall, however, notice each separately.

I. Dr. Gully commences his work with an introduction in which we have a brief but clear and neat sketch of the medical theories that from time to time have given a tone to practice. In Chapter i. the expectant

method of treatment is traced historically, and, as far as the limited space will allow, satisfactorily. It is thus defined :

"The expectant plan of treatment, strictly speaking, involves the necessity of awaiting the operations of nature in the case of disease. A more extended meaning includes the addition of artificial means, only as auxiliary to the efforts of nature, those efforts being the sole guide of the practitioner. It is in this latter sense that expectant medicine is to be understood. A physician, therefore, who professes to act upon expectant notions of treatment, takes it for granted that the constant tendency of the diseased body is towards cure, and this, for the most part, by the erection of certain modes of vital action in other parts of the frame than that which is morbid, and by the elimination of certain matters from the different emunctories. Thus he observes that the appearance of an eruption on the skin is simultaneous with the removal of some internal disorder ; and that a fever usually declines just as the kidneys, the lower bowel, or the skin, pour out their respective excretions copiously. Acting on the hint thus afforded by the system, he waits for the commencement of any of these signals of relief, and then urges his remedies in the same direction that nature takes ; not purging, if the kidneys are dissipating the fever, nor giving diuretics when the skin is bathed in sweat for a similar kind of purpose. This is the leading idea in his treatment. In the details, he follows it out by giving diluents plentifully, because nature craves for them, and forbids strong food, because nature loathes it ; orders the recumbent posture, because the frame inclines to it ; commands the withdrawal from food and light, because they are painful ; and recommends abstraction of the mind from thoughts that require exertion, since he knows that nature is not capable of a genuine effort at such a time, but inclines rather to languor. He further regulates the temperature of the chamber with great precision : looks to the bedding and the positions in the bed of his patient ; in short gives particular attention to the physical comforts that may add to the ease of his frame. Moreover, he has reference to the age, sex, temperament, and other circumstances of the individual ; varies his means with the different periods of the disorder ; assists the imperfect crisis of it, &c.

"Thus an enlightened system of expectancy does not signify an indolent awaiting of the event of the disease, leaving that event to the chances of the corporeal powers. It supposes a very precise knowledge of the history, particular characteristics, and progress of diseases ; a close observation of their different periods, and the directions into which their crises may flow ; and a very nice attention to the physical and moral regimen of the patient." (p. 32 et seq.)

This is a very fair account. Such doctrines are of course theoretical ; they are not pure empiricism. The following sentence is not quite in accordance with what we think the fact :

"In diseases of a chronic character, which only involve the functions of a part, he attaches importance to negative rather than positive means ; these consisting in the quiescence of the organs affected. He holds that if this be strictly enforced, the natural powers will always restore the healthy condition ; and that, on the other hand, if these powers be taxed to carry on their morbid function in addition to the restorative process ; or, further, if they be interrupted by imagined auxiliaries in the shape of medicines, such condition is postponed or hurried into the contrary extreme of organic disorder." (p. 37.)

There are many cases of chronic functional disease, in which the expectant physician sees only the commencement of structural disease ; and in which the tendency of the natural powers is always towards greater disease and to death. In such cases he has no hope of curing, but is too happy if he can retard or arrest this tendency to a morbid state.

In the second chapter, the progress of the revulsive method is traced, and the remedial means most commonly used to carry it out, are detailed. This method is actively antiphlogistic and pharmaceutic. The abstraction of blood, purgatives, emetics, diuretics, diaphoretics, and counter-irritants, are the antiphlogistic means; expectorants, deobstruents, carminatives, and the like, the pharmaceutic.

"A physician acting on this treatment, in a case of simple fever, would, in the first place, attempt to 'cut it short,' as it is termed, by a copious bleeding from the arm, and, immediately on the limb being bound up, by an emetic. If this does not dispose of the fever in a few hours, he administers repeated doses of calomel, opium, and antimonial powder, with some powerful cathartics, in which he persists, in the expectation of causing healthy evacuations. In the meanwhile, time is found for the administration of a mixture of sudorifics and diuretics. So things go on for six or seven days, the patient being told, as regards diet, that he can take 'any little thing he fancies,' but not beef-steak or mutton-chop. At length the brain gives symptoms of being affected —delirium supervenes. Then begins the array of revulsives on the external surface : the head is shaved, ice is applied at the back and front, and a blister on the top of it. The delirium passing from the furious to the muttering kind, the tongue becoming dry and brown, the limbs utterly powerless ; in short, all the signs of a typhoid state appearing, the stomach is once more tried with wine and other stimulants, the feet are blistered, and exhausted nature sinks ; or if, in spite of all, the jaws of death are escaped, the body drained of its blood, worn out after the enormous stimulation, and utterly thrown out of the rhythm of its sympathies and functions, drags through a prolonged convalescence, with a tardy recruiting of the quantity, and still more slow restoration of the quality, of the vital fluid it had lost, and of the nervous energy it had previously possessed. Even in this state a little revulsion is essayed in the form of bitter tonics, carminatives, antispasmodics, &c., and sometimes a relapse into another species of fever called nervous is thereby brought about." (p. 66.)

Dr. Gully remarks that Hippocrates never practised the revulsive method before the fourth day ; but does not notice the fact, that it was the peculiar doctrine of critical days that directed his practice, and the observation of which contributed so materially to his fame. The intermittent nature of disease must most certainly be better understood before we can practise medicine scientifically, whether we practise the revulsive or expectant plan. Dr. Holland has an interesting essay on the subject in his " Medical Notes and Reflections ;" and more recently, Dr. Laycock has attempted to demonstrate a *general law* of vital periodicity ; and to point out the measure of time by which the periods are regulated. If his researches prove to be correct, a considerable change must necessarily take place in both the theory and practice of medicine.

The third chapter is occupied with the simple treatment of disease, and constitutes the remaining half of the volume. We anticipated an elucidation of the merits peculiar to the two systems already reviewed, based upon modern discoveries in anatomy and physiology ; or at least we expected a philosophical comparison of blind empiricism on the one hand, and of scientific hypotheses on the other, so that an eclectic method, simple from its grandeur, would be the result. We must, however, be honest, and say this third chapter has sadly disappointed us, for it has presented us with nothing more than a system of medicine of the author's own, and, what is curious, a system remarkable for its diminutive proportions. Dr. Gully slides into the statement of his own views very neatly.

" . . . . As in my opinion, a choice is to be made from, rather than be-
tween, both [methods], the comparison can only be established with reference
to their propriety in the individual diseases of the body. This implies the state-
ment of certain peculiarities in the vital actions, and of the relative importance
of the various series of organs which minister to those actions in health and
disease. Further, it will be requisite to enumerate some generally-received
propositions regarding the sympathies, by virtue of which disease is propagated
from one organ or series to other organs. After which it will not be difficult
to point out the instances in which expectant and revulsive medication are res-
pectively applicable." (p. 89.)

The sympathies mentioned play between the organs of vegetative and
animal life, or between organs of each class. " Irritation of the stomach,
for instance [the stomach is a vegetative organ], begets what is called
sick headach," or an affection of an animal organ—the brain ; or " dis-
ordered stomach begets cough with expectoration or sore throat ;" in
other words, disorder of a vegetative organ " begets" diseases of vege-
tative organs. Diseases vary as they commence in organs of vegetable
or animal life, and require proportionately different treatment. The
grand truth, however, is " that *no one sinks under disease until it has
invaded the viscera of vegetative and animal life.*" It would perhaps
be the fairest to Dr. Gully to quote his own " *resumè.*"

" Disease commences on the external surface or skin ; the internal surface
or viscera of vegetative life ; or in the brain and spinal cord, the viscera of ani-
mal life. Commencing on the external surface, it is propagated to the internal
and to the brain. Commencing in the internal surface, it is propagated to the
external and to the brain. Or in the brain, to the viscera of vegetative life and
the skin. So long as disease commencing in the skin is not propagated beyond
a certain degree to the viscera, life is not compromised. So long as disease
commencing in the viscera of the abdomen and chest is not propagated beyond
a certain degree to the brain, life is not compromised. So long as disease
commencing in or propagated to the brain does not react on the other viscera,
beyond a certain degree, life is not compromised. Hence the axiom that ' death
comes only by the viscera.' The great aim of treatment, therefore, is to with-
draw irritations from the viscera, and to save animal life. The dependence of
the abdominal viscera upon, and their connexion with, the brain, is not so great
and immediate as those of the chest. General febrile states, whether owing to
inflammation or irritation of the abdominal mucous lining or not, certainly be-
gin and disappear with them. The same applies to chronic diseases of that
membrane. In preventing the propagation of these to the brain, the expectant
treatment is applicable, for the reason given in the last paragraph. In the
acute disorders of the coverings of the abdominal viscera, the propagation to
the brain being more speedy, revulsion is more demanded. The dependence of
the thoracic viscera upon and their connexion with the brain, is more imme-
diate than those of the abdomen. Revulsion on the latter is therefore necessary
and proper in acute diseases of the chest. In its chronic disorders, revulsion
on the external surface is more decidedly indicated. Disease of the brain in-
variably operates on the viscera of the abdomen and chest. If acute, it requires
active revulsion both on the external and internal surfaces. If chronic, the
viscera of vegetative life becoming deeply affected and reacting upon the brain,
revulsion on them is not so applicable as on the external surface.

" In all disease, the end of treatment is to spare the viscera. When the ab-
dominal viscera are prominently disordered, they should be spared at the ex-
pense of the skin. When the viscera of the chest and brain are the seats of
disorder, they should be spared at the expense of the digestive organs and
skin." (p. 189 et seq.)

Expectancy is passive treatment, revulsion active treatment. We must draw the sword of revulsion on diseases situate in organs of animal life, for the citadel of life is in danger ; we must let vegetative organs alone, and their diseases will disappear spontaneously ; or, if they threaten to spread to organs of animal life, we must starve or poultice them into submission. They must not be irritated by medicines. Senna is too powerful a cathartic ; a teaspoonful of castor-oil with four or five grains of rhubarb is quite enough ; but better than both, is a purgative enema to " cleanse out the lower bowel."

The treatment of acute and chronic indigestion, of fevers, of diseases of the thorax and brain, is then laid down. We have room for a case of inflammatory fever only. The patient was a gentleman, twenty-nine years of age, and fond of dining out and going to balls.

" In this case there were the usual signs of inflammatory fever : headach, suffused eyes, dry tongue, excessive thirst, hard, rapid pulse, torpid bowels, scanty urine, dry, hot skin, prostration of strength though the body was restless, sleeplessness, &c. The abdomen was sensitive on pressure, although to no great extent. The patient being in bed, the room rendered obscure, and a portion of the windows opened to admit air, an enema of castor-oil and warm gruel was administered, which caused an evacuation of hard and somewhat dark-coloured fæces. For the double purpose of quenching thirst, and acting upon the upper portion of the canal, small and frequently repeated doses of carbonate of potass, with citric acid taken in an effervescing state were given. As soon, however, as the enema had operated, and after two or three doses of the effervescing medicine, fomentation of the abdomen with flannels wrung out of boiling water, and changed every five minutes, was assiduously practised during three hours. Two hours after this had been suspended the saline acted rather freely, and was discontinued for a few hours. Meanwhile, cold water and soda-water were permitted in quantities of two wine-glasses at once, and at intervals of twenty minutes or half an hour. The forehead and temples were wetted with Cologne water, the evaporation of which was constantly encouraged by fanning. The face, hands, and feet were sponged with tepid water, and carefully wiped, every two or three hours. As far as it was practicable, all noise was withdrawn, and the visits and conversation of friends forbidden. In the evening, when, as is usual, the febrile heat and restlessness somewhat augmented, the fomentation and saline draughts were recommenced, the former continued for three hours again, and the latter during the greater portion of the night." (p. 122.)

Well, this kind of treatment " was continued for eight days, with some slight variations as to the time and mode of evacuating the bowels, as to the length of the fomentations, and as to the fluids to be taken, which consisted sometimes of rice-water, barley-water, and occasionally of lemonade," and the patient was able to walk about his room in twenty days from the commencement of the attack.

Another case illustrates the treatment of " typhoid fever," but the details are similar except in some minor matters ; as, for example, flour of mustard is used for fomentation, and a linseed poultice applied to the abdomen. Next comes a case of " fever with rheumatic pain," then one of infantile remittent. The treatment of the exanthemata occupies no more than three widely printed duodecimo pages,—so simple is Dr. Gully's method.

The treatment of diseases of the lungs, heart, and brain follows ; the principles of Dr. Gully, so far as we can see, differing little from the principles of any other tolerably well-informed practitioner, provided the

theoretical phrases of our author be translated into common nosological language. Dr. Gully, we opine, has not had an extensive practice, at least among the middle and lower classes of society; or, he can never mean that such "simple treatment" as we have detailed can be generally applicable in such a sphere of life. Where is the Cologne water to come from ? and the relays of nurses to foment, and the fanners, the ice, the thermometers to regulate temperature, the inhalers ? These probably would be within the means of one patient in five hundred, and not one nurse in twenty would attend to the directions.

In chronic diseases of the lungs Dr. Gully recommends the use of opiate liniments, and we join him in that recommendation. In a note, Dr. Gully states that metastasis to the heart and brain in " rheumatic inflammation of the limbs" is much less frequent than commonly supposed. He has treated, or seen treated, " a vast number of cases," and can only testify to having witnessed seven or eight. Dr. Gully ought to know, that if nobody will doubt his statement, nobody will attach any weight to it. Where is the record of this " vast number ?" Dr. Gully thinks it a newly discovered fact that atonic congestion of the brain may be brought on by profuse bloodletting ; we thought the fact was well known to all but those illiterate practitioners who pride themselves upon never reading a book, and assume the title of " practical men."

We believe we have given a fair view of the nature and contents of Dr. Gully's publication, and our readers will be fully able to estimate the value of it for themselves. We suspect it will not answer the author's purpose. It is neither popular nor scientific. The literary execution of the work, excepting in the earlier pages, is very indifferent ; it has been somewhat of a penance to us to read it. Technical words are continually used with a canting or popular meaning. A patient suffering from " typhoid fever" sometimes took ice into his mouth instead of iced water; and we are told that " the *gusto* with which he crushed it between his teeth was highly illustrative of the *intense fever* of the stomach." The same patient had a linseed-meal poultice applied " over the *whole body*," and the ludicrous idea is excited of a patient being put to bed after being dipped to the ears in a tub of the cataplasm. " Body" means abdomen with Dr. Gully ; a clinical use of the word we always thought peculiar to ladies and nurses. The physiology displayed in the volume is far from precise, and not seldom gratuitous.

II. The work of Dr. Richter comprises three sections. The first of these is an introduction to the other two, and consists of an exposition of the principles which should guide physicians in their researches. The second treats of the spontaneous origin and cure of disease. The third considers the origin and cure of disease by art. The whole may be viewed as an attempt to connect the modern discoveries in physiology and pathology with empirical theories in medicine.

Hippocrates first stated the fundamental doctrine of the expectant method, namely, that the constant tendency of the diseased body is towards cure. This tendency, our author shows, is dependent upon the general laws of development and of self-preservation in the organism ; a view already fully expounded in a previous publication of his on the " water-cure," but applied in the present work to general pathology and therapeutics.

The general idea respecting the so-called *vis medicatrix naturæ* is this: that the organism and the disease are conflicting powers, and that the *vis medicatrix* steps in as a third power, to the assistance of the organism. The therapeutics founded upon this idea consist, mainly, in an idle waiting for the result of the conflict, being a purely *methodus exspectativa.* Our author acknowledges, indeed asserts, that there is a *vis medicatrix naturæ;* but maintains that it is not (to use the expression of Van Helmont) an *ignotus hospes* in the system. It is no other than the innate organizing force of the organism, of which the *nisus formativus* of Blumenbach is a modification, not only evolving the individual from the ovum, but carrying him on to his full development, and maintaining him in existence. In fulfilling the latter duty, there is a continual alternation of life and death in the system. This power both organizes unorganized matter and disorganizes vitalized matter; separating the latter also from the system, after it has fulfilled its uses in the organism, and has become (if detained) a hurtful agent. This separation is the act of the so-called *vis medicatrix.* If the recomposing and decomposing processes are in equilibrium there is health; but if the effete matter be not cast off, or a hurtful agent enter the system from without, the equilibrium is destroyed, and the innate vital force sets up an action to restore it (therapia interna), the resulting phenomena being the phenomena of disease. So that morbid action consists in an interruption of the renewing or reformative process concurrently with alterations in the qualities of the blood, and a reaction of the innate vital force to restore the normal state. The *schädliche Potenz,* or hurtful agent, is eliminated from the system through the secreting and excreting organs; or, not being fully eliminated, is localized in some one or more special structures, thus giving rise to various constitutional and chronic local diseases. According to these views, healthy and morbid action are identical; or rather, the healthy is the type of the morbid.

Setting out from these principles, Dr. Richter examines the pathology of acute and chronic diseases, explaining their diversities and similarities, and deducing many very ingenious, and, we must say, somewhat paradoxical propositions. Fever (even hectic fever) is a healthy process. The innate vital force, feeling the presence of a hurtful agent in the system, attempts its removal after the same manner as it removes effete matter. The decomposing process overbalances the recomposing, or renewing; a colliquescence or colliquation of the various organs is the result; and this continues until the object is attained; when the recomposing process assumes the superiority, until the equilibrium between the two processes is reestablished. If the hurtful agent is not eliminated it is located in an organ, and the innate vital force attempts its removal by colliquation of that organ, giving rise to the various changes of structure described by pathological anatomist, and to the general symptoms of local disease. Hectic fever is in reality a healing process, set up to expel the hurtful power from the organ to which it has retreated; and is injurious only, because the hurtful power is of such a nature, or so situate, as to require for its expulsion a greater effort than the vital machinery will bear; so that the recomposing process is never reestablished, and the colliquation goes on until dissolution of the organism, or death takes place.

As the hurtful powers differ in composition, so they have varying affi-

nities for the different organs and structures of the system. The poison
of rabies, as well as mercury, passes off by the salivary glands. Some
hurtful agents fix more particularly in the osseous structures, others are
eliminated from the skin and mucous membranes; and Dr. Richter as-
serts that the globules of mucus present under the microscope differences
in form, colour, and size, as diseases differ. The results of his researches
on this part of the subject, are promised to the public at a future oppor-
tunity. Dr. Richter is opposed to the opinion of Henle respecting the
existence of a *contagium animatum* as a cause of disease, but draws a
very curious parallel between the fermentative process and the develop-
ment and increase of contagious matter, especially in the exanthemata.
The idea of a *contagium animatum* is by no means novel; and the new
views respecting the vegetable composition of yeast, promulgated by
Caingard de la Tour and Schwann, and confirmed by Dr. Richter, may
be considered rather favorable than otherwise to Henle's notions. Ac-
cording to the new views referred to, yeast is composed of organized cells
capable of reproduction, like the simplest cryptogamia, and we do not
see why the parallel drawn by Dr. Richter between the phenomena of
fermentation and of the exanthemata, may not be extended so as to com-
prise the first cause of both. Without saying one word in favour of
Henle's views, we may fairly assert that the objections of Dr. Richter are
peculiarly invalid. A *contagium animatum* is at least as probable as a
fermentation of humours.

We cannot follow Dr. Richter through his pathological details. The
treatment necessarily flowing from the principles he advocates, is purely
eclectic. Health and disease exist, and disappear, as the action of the
principle of self-preservation in the organism takes place under homo-
geneous and friendly, or heterogeneous and unfriendly, external in-
fluences. In treating disease, the sagacious physician will act in accord-
ance with these views. When the innate vital force is equal to the
restorative effort, he will wait the result; or, in other words, adopt the
expectant method. If its action is blindly violent, and likely to lead to
serious local disease, or to dissolution, the treatment will be revulsive.
If it wants assistance, the physician will consider by what organs, and in
what mode, it is attempting to expel the hurtful power, and direct his
remedial means accordingly. He will remember the maxim, " *ubi irri-
tatio, ibi fluxus*," and that observation has demonstrated, not only that
the various hurtful powers have varying affinities for different organs, but
that remedial agents have like varying affinities. Mercury excites ab-
normal plasticity in mucous membranes; copaiba developes a morbillary
eruption; belladonna a scarlet rash. Narcotics induce a thickening and
swelling of the nerves;—the aqua lauro cerasi, for example, so changes
the pneumogastric nerve. Strychnia has distinctly chemical relations to
the organized substratum of the spinal cord; quinine evidently acts upon
the ganglionic system. Watching, therefore, the efforts of the innate
vital force, and the symptoms it excites, the sagacious physician will assist
it, by setting up a mode of action analogous to its own; treating the dis-
ease, in fact, on the homœopathic maxim of *similia similibus curantur;*
for as morbid action is healthy action, the cure must be the same as the
disease,—medicines only assisting the healthy action of nature in throwing
off the hurtful power,—the *schädliche Potenz*. The application of this

maxim of homœopathy must, however, be limited within the principles
Dr. Richter lays down.   Thirst, for example, must not be cured by in-
ducing thirst.   This sensation is excited by the innate force, that the free
imbibition of water may be provoked.   Water promotes the colliquative,
or decomposing process ; and thirst is most observed in fevers in which
an active colliquative process is most required to get rid of the hurtful
agent.

In short, Dr. Richter is a humoral pathologist, and an eclectic prac-
titioner.   He recommends all and every method of treatment,—the ex-
pectant, revulsive, simple, homœopathic, hydriatic.   This is nothing new.
The judicious and eclectic physician has long acted upon the views of
Dr. Richter.   Common sense informs us that each method may be useful
in suitable cases ; and common sense equally assures us that none but
quacks and foolish enthusiasts will exclusively apply any one of them
to all cases indiscriminately.   The diplomatized Hydriaticians are just as
quackish and dangerous as the untitled Morrisonian revulsionists ;
perhaps more dangerous, certainly more quackish.

The result of the comparison of the two works before us is unfavorable
to Dr. Gully.   Dr. Richter's is purely scientific, and breathes the true
spirit of a philosopher ; Dr. Gully's exhibits on the part of its author the
tricky wish to stand well with the profession, and catch, at the same time,
the popular ear.   Dr. Gully will find out that, in this respect, he has at-
tempted too much.

Art. X.

*The Reciprocal Influence of Body and Mind considered ; as it affects
the great questions of Education, Phrenology, Materialism, Moral
Advancement, and Responsibility,—Man's free agency, the theory of
life, the peculiarities of mental property, mental diseases, the agency
of mind upon the body, of physical temperament upon the manifesta-
tions of mind and upon the expression of religious feelings.*   By W.
Newnham, Esq. m.r.s l.—*London*, 1842.   8vo, pp. 628.

Mr. Newnham is known as an author in two capacities :   He has
written several works of a strictly religious kind, one of which has had
an extensive circulation ; as well as some scientific pamphlets, (such as
an Essay on the Disorders of Literary Men, and a Report on the Progress
of Surgery,) indicating his knowledge of the modern literature of his pro-
fession, his literary industry, and his own practical acquirements.   In
the present volume he has indulged his tastes by uniting his favorite
topics, as it embraces subjects which require in their investigation the
knowledge both of religious and medical science.   It was the opinion of
a metaphysician, whose views have had an extensive influence on the
thinkers of the present day, that mental philosophy could never be tho-
roughly investigated, except by one who was versed in physiology and
pathology, as well as in the actions of the mind itself abstracted from
matter ; a view which a medical man who has witnessed the manifold
and strange influences of the body on the mind, and has considered the
workings of his own mind, will admit the truth of without hesitation.
And when the difficulty of the investigation, its complexity, extent, and

practical importance are considered, any attempt to throw light upon its darkness by one who possesses, in a measure, both these qualifications, must be looked at with pleasure. Mr. Newnham's previous writings show that the study of mental phenomena has been a favorite one for many years. He is evidently a serious-minded man, sincerely and earnestly convinced of the reality of religious influences, and of their paramount importance; and a large practice for a long series of years must have regularly supplied him with objects of reflection, with facts, with matters, both to form his views, theories, or speculations, and to test their correctness.

Fearlessly to acknowledge the immense influence of matter on the outward manifestations of the mind can best be done by one who is deeply convinced that mind and matter are not identical; that mind is a great power, an agent, using matter as its medium. But still more necessary is it that a writer who, in the present time, boldly marks out the influence of physical temperament upon the expression of religious feeling, should himself be the subject of and therefore the unaffected believer in religious influences. In a scientific point of view this must be necessary. Unless a man has felt himself the influence of religion on his own mind and body, he is unable accurately and fully to understand its influence upon others. For a writer who addresses himself to general readers, especially to those of a religious cast, the necessity of this is obvious. Unless they believe in his sympathy with themselves in spiritual matters, and in his full recognition of feelings and of motives they themselves possess, they will not readily believe him when he explains to them that deep despondency, or, still more unlikely, extravagant hope and joy, are feelings which depend not so much on the condition of their soul, as on an irritable condition of their splanchnic nerves, or an accelerated circulation through the brain. We would illustrate this by an anecdote. A clergyman's wife, a strong-minded, serious person, was applied to, in the absence of her husband, by a woman for religious consolation in mental despondency of an exaggerated kind. The morbid body was as evident as the morbid mind. The lady gave her some opening pills, and told her to call again. Under similar circumstances, a medical man who had suggested the same remedy might have been considered but little better than one of the wicked.

It is true, to a certain extent, that religion does not come under our jurisdiction as medical reviewers; but all branches of knowledge are so connected together as to touch each other at some points, although in others their distinction is most obvious. The colours of the sky at sunset may be most various; the deep blue of the zenith may be in the strongest contrast with the deep orange of the horizon; but trace them as they join, and you cannot mark where one begins and the other ends, so harmoniously do they melt into each other: and so it is with all knowledge. Man divides it for his convenient study, and nothing is clearer than his divisions if regarded at those distances where the opposition and the contrast are greatest; but who can draw the line at others? It is not our business to discuss the meaning of religious terms, or weigh the merits of peculiar doctrines; we have nothing to do with the thirty-nine articles or with No. XC., but religion, regarded as an influence, or even merely as a subject which powerfully engages the thoughts and feelings, and there-

fore acts upon the brain and nervous system, comes within our daily ob-
servation, and demands our scrutiny.   How many thousands are there
in Great Britain at the present moment who make religious reading their
single intellectual exercise, and for whom religious observances stand in
the place of all diversions, excitements, and amusements ?   They are
surely occupied with something which intensely engages their attention,
deeply interests their feelings, and of the reality of which they are entirely
convinced—something, which in many instances is believed to be the
cause of the profoundest melancholy, or the completest mental happiness;
of the most hopeless insanity of individuals ; of the wildest vagaries or
of the most sober, serious, matter-of-fact earnestness of whole communi-
ties ; of all the forms which under the names of enthusiasm or of fanaticism
have supplied so many pages of the history of mankind.   Who, then,
that studies the human mind can omit the contemplation of these phe-
nomena ?   And if the mind does act upon the body, and the body recipro-
cally upon the mind, no investigator of this mutual influence can
neglect this branch of examination.

The wards of a madhouse most fearfully illustrate these strong influ-
ences when exaggerated and distorted by disease.   That bloated, red-
nosed, middle-aged mechanic, who roars at you as you look into his cell,
pouring out a torrent of blasphemous and obscene slang, thinks himself
" God ;" and those two weak feeble women, who are cowering together
in close, quiet conversation, believe themselves to be Christ and the
Holy Spirit ; whilst the moping melancholics, wandering alone, are the
victims of the most morbid religious despair.   And, in a less degree, the
medical practitioner meets in his daily rounds with cases illustrating the
same influences,—sometimes morbid, producing undue fear and depres-
sion which counteract all physical means ; sometimes healthful, pro-
ducing a condition of mind in disease eminently conducive to recovery,
or, where the complaint is incurable, entirely reconciling the individual
to his lot : and, however willing he may be to acknowledge the power of
mind over matter, he cannot but be struck with the constant influence of
the body upon such states of mind, and the expressions of feelings re-
garded perhaps by the subject of them and his friends as exclusively
spiritual.   This being the case, we feel we are not stepping out of our
province by giving Mr. Newnham's views on this branch of the medical
philosophy of the mind and of its organ.

A considerable portion of this volume is taken up with the subjects of
life, materialism, phrenology, man's free agency and responsibility, the
differences between his mind and those of brutes, &c. They are discussed
by one who is not disposed indolently to shirk any question bearing upon
his principal subject, but willing to place each side of it in every light
before his own mind, and to decide for himself its value.   His endeavour
obviously is to be fair, honest, and true ; and he is always charitable.
With these branches of the subject our space will not allow us to grapple,
as our wide differences with the author on many points would entail long
discussions ; we shall confine ourselves to the main subject, the reci-
procal influence of the mind and body, extracting, analysing, and com-
pressing what appears either new or else well stated, as the result of Mr.
Newnham's own observation and reflection.

The contents of the whole volume (a very thick one) have evidently

been written at various times when the particular subject was fresh in the writer's mind, and often at long intervals; and the author's occupation, an extensive country practice, is one of all others least calculated to encourage concentrated or continuous thought. This explains a certain prolixity and diffuseness, and a deficiency of clear order and arrangement which makes our task somewhat difficult; but we must also explain that we shall be obliged often to curtail most extensively the author's course of reasoning, which is generally too long to be given entire. We think it also necessary to state that while dissenting from many of Mr. Newnham's physiological and psychological views, we shall not stop to discuss the point with him, as the belief entertained respecting the precise nature of such phenomena does not vitiate the arguments, much less destroy the importance of the facts adduced in illustration of the main investigation—the reciprocal influence of body and mind. The meaning of the terms cannot be mistaken, although entirely different views may be entertained of the nature of the things to which the terms are applied.

Education, moral and physical. The chief object of Mr. Newnham's work is to direct attention to the influence of the temperament of the body on the mind, in health and in disease. Education (he says) may modify, soften, direct, and improve the mind; but it cannot change the physical temperament, which always gives a tinge to the thoughts, feelings, and actions of the individuals. The kind and degree of mental power are dependent upon physical constitution. Differences in intellect and in attainments depend on the greater or less perfection of the brain, and its adaptation for peculiar pursuits. The immaterial principle presides over the brain, through which its operations are manifested. The brain is the servant, the mind is fitted to govern and to direct it, so that man is a free agent. " By his *will* he can control, suspend, or encourage any one of his peculiarities." He is consequently responsible for all he does, says, or thinks. Hence the necessity of education, especially when young, " the free agency of the man depending upon the education of the child ; for if this be not what it ought to be, he will become the slave of his passions and propensities, and he will lose his intellectual and his spiritual freedom." This education, consequently, is of two sorts; the education of the body and of the mind.

" A first claim to attention is presented by all which relates to the health of the body, and of those several organs and functions which in their influence, immediate or remote, exert a generic or specific agency upon the organ of mind: and a second, and not inferior claim, is to be found for all those processes, through which the dominion of intellect may be enlarged, the evil passions and propensities may be controlled, and the mind may be prepared for that moral and religious training which is to complete the perfection of man as a rational and accountable being." (p. 28.)

To continue our analysis. What is true of other organs is true of the brain—that to secure healthy function the organ must be *exercised :* that lengthened repose is fatal to its *tone :* and that excessive exertion, or irritative action, will produce diminished power, or feebleness. The capacity of the brain for exertion is progressive : it cannot be stationary. It is a mistake to suppose that the brain will suffer from judicious exercise. The danger is in " fitful exertion," great exercise after long inaction. Gradual employment is to be pursued, so as not to induce excessive or irritative

action, which may be occasioned by long-continued exertion giving rise
to exhaustion, and followed by irritability, which state may be mistaken
for *power*, but which will eventually terminate in feebleness.   The same
morbid state may be brought about by stimuli, or by the lavish excite-
ment of the feelings, and of emotion.   The brain and the stomach are in
close sympathetic connexion, and if the stomach is overtaxed the brain is
weakened and oppressed, and eventually its powers are impaired, and
permanent disorganization follows : hence the necessity of control-
ling the stomach.

Mr. Newnham's psychical physiology is of the most complex kind : he
believes that life is a principle added to organization, and that man has
a spiritual principle added to life, which distinguishes him from brutes,
but which is " characterized, modified, and sometimes perverted," by
the brain through which it acts.

Effect of the passions.   The influence of the passions on animal life
is discussed, and the following passage is given as the explanation of the
mode in which painful conditions of the mind impair the general health :

" A painful impression is made, is perceived by the brain, and communicated
to the mind, which becomes preoccupied by it, and makes, in consequence, large
demands on the cerebral agency ; then nervous influence which is daily pro-
duced in order to support the bodily actions, and the mental manifestations, is
too exclusively taken up by the latter—not so much, perhaps, for the purpose
of manifestation, as for the infinitely more consuming office of bearing up under,
or concealing the constant misery of a wounded spirit. Concentrated and hidden
suffering is that which makes the largest demands upon the brain. Now, the
result of this is, that a certain quantity only being daily produced, and an undue
proportion being given to spiritual suffering, enough is not left to maintain the
functions of organic life in all their integrity : the supply of nervous energy to
the respective organs is irregular, or insufficient, or perverted; and disorder of
the animal functions is the consequence." (p. 258.)

" A certain amount of nervous energy is necessary to the function of diges-
tion ; cut off this supply entirely, and digestion is impossible ; let it be insuf-
ficient, and digestion is only partially accomplished; let it be perverted, and a
depraved form of digestion occurs ; irritation and uneasiness of the stomach are
produced, with acidity and a long train of horrors ; these produce a reflex in-
fluence upon the brain, shown first in unwonted sleepiness and inaptitude for
intellectual pursuits, followed closely by dreams, and uneasy and unrefreshing
sleep ; next morning the patient gets up listless and feeble, and the bodily as
well as the intellectual functions are disturbed ; headach and irritability are the
result ; nervous energy is wasted upon trifles, or worse than trifles ; the hour
of dinner recurs ; there is less power of digestion than the day before ; and this
goes on oftentimes in a rapidly-augmenting ratio, till the stomach becomes the
seat of chronic inflammation, and ulceration, or other morbid action, which, by
slow degrees, conducts the patient to the tomb, the victim of his own actions,
and frequently the miserable and the voluntary suicide of his own better feelings
and principles." (p. 261.)

Where the stomach itself escapes, the food is imperfectly digested, and
the process of sanguification is consequently impaired ; nutrition is im-
possible ; the patient grows thin ; the brain is insufficiently supplied with
blood, and nervous power is impaired and unequally distributed, produ-
cing various local irritations, distress of the head, less aptitude for intel-
lectual pursuits, a greater prevalence of the peculiar temperament with
diminished power of the will, till the weakest organ fails, and local being
superadded to general disorder, the system is at length worn out.

The influence of " the interior life upon the body" is shown by many little well-known circumstances.

"Witness the suffusion of the countenance in blushing ; the shrunk features and pale goose-skin produced by alarm ; the chattering of the teeth under fear ; the increase of various secretions from mental emotion, as of the tears in sorrow, or the bile in anger; the palpitation of the heart, under almost every sudden emotion, the short and quickened breathing of expectation, the oppressed and stifled respiration of intense and harrowing emotion, the arrested and almost imperceptible action of breathless anxiety and expectancy; the influence upon the muscles of expression of the countenance, alternately lighted up with joy, or worn with anxiety or suffering, and the thousand varied emotions which they are capable of expressing ; the plump portliness of the man at ease, and the extreme thinness of the victim of deep disappointment, or of any long-continued devouring passion; so that to be dried by grief—to be devoured by remorse—to be consumed by sorrow—are not only common expressions, but literal representations of actual bodily conditions." (p. 263.)

It has been urged as an argument against materialism that the mind becomes more mature as the body decays. Mr. N. very justly combats this, and shows that man's moral nature may improve, he may use more self-control, he may have more equanimity, benevolence, and love to others ; but that the power of his intellect diminishes as the brain, like the rest of the body, becomes more feeble.

That the brain partakes of the general decay, is shown by literary labour becoming irksome ; the power of application, and the love of pursuit, diminished ; the perception slow, the imagination extinct, the memory of the immediate past lost, judgment infirm and vacillating. The sight is often the first to give way, the hearing becomes less acute, the touch and smelling obtuse, and all cease to convey slight impressions or accurate notices to the intelligent principle within. The feebleness of the voice, and of the power of locomotion, equally show the diminution of nervous power as age creeps on.

Even the *spiritual principle* (Mr. N. says) is liable to disorder ! Any disturbance of this spirit will irritate the brain, and render it unfit for the full and perfect performance of its function ; and every little bodily ailment will prevent the brain from being the willing servant of the spirit within.

Conscience. The influence of physical disorder on the conscience is thus described :

"Conscience is a faculty which insanity often distorts, and which the minor disturbances of the body very frequently pervert, by producing a degree of fearfulness and hesitation, which render man uncertain in his opinions, changeful in his judgment, and vacillating in action; he becomes doubtful upon trifles; he magnifies their importance ; he wishes to do right, but cannot discover what is right; when he thinks he has attained to a just judgment, he is turned aside by some veriest straw in the scale of moral action ; he becomes the slave of superstitious observances; he is always desirous of propitiating the goodwill of his neighbours, and of deprecating the wrath of the Almighty ; yet he seeks to accomplish this object, not by the firmness and fearlessness of right, but by seeking to please others. The frequent failure thus produced will occasion remorse, and this again will give rise to a very unfavorable and depressing influence upon the powers of life.

Reflection. " Intimately connected with the power of conscience," says Mr. N. " is the habit of *reflection*......But there are morbid states of this

process: man may become *too reflective* a character; his associations with exterior life may be broken up; he may be lost in his own thoughtfulness; become deaf to the impressions of exterior life, from which his knowledge is to be derived; and while occupied with his reflections he may allow the time for action to pass by. The contemplative character, and, with a still deeper shade, the pensive, are morbid states of reflection, and, as such, ought to be avoided." (p. 342)

Memory. Mr. Newnham next considers memory. He has several times noticed a good memory become feeble and worthless from morbid action in the brain. Sometimes the injury has been permanent, in others it has been slowly recovered when the diseased action has ceased. In such cases the attention is first impaired, which will account for the impaired recollection of immediate or recent impressions; but the loss extends to circumstances which had formerly made a lively impression, and had been remembered up to the time of the invasion of the physical disorder. This is an important symptom, leading to the early detection of cerebral disease; and the earliest indications should be attended to. Sometimes the individual feels he has not the power of directing and fixing his attention to any subject which involves consecutive reasoning. Even in common reading, he finds he reads and reads again, without being one jot the wiser, and this happens not from the common cause—of the thoughts directed elsewhere.

Absence of mind may be a symptom of disease of the brain; it is at all times a formidable symptom, not that it may not exist without disease, but it is a frequent early symptom of cerebral mischief. In another condition, impressions on the senses make so little impression, or such incorrect ones, as to stimulate the brain erroneously. The patient is in a kind of dream; involuntary trains of thought enjoy the control of the mind. An aggravation of these states occurs when no impressions are received at all.

"Let, then, the first symptoms of unwonted forgetfulness—of unusual listlessness—of unaccustomed indisposition to exertion—of diminished energy—of shrinking from application—of retirement from duty— of omission of details— of perversion of thought, of reasoning, or plans—let any one of these symptoms be early discovered, and zealously watched, for there is no time to lose; the brain must be saved, or death or insanity may follow." (p. 348.)

It is hardly necessary to remind our readers that the importance to be attached to these symptoms of mental debility depends on any of them being foreign to the patient's ordinary condition of mind,—otherwise, how many of our patients would afford a very gloomy prognosis! The following is an important practical hint:

"This state is one which will not generally bear depletion; it does not consist in too much arterial action, nor in venous congestion, but in torpor of the nervous fibre, which will commonly be augmented by depleting measures. Nothing is more mischievous than to mistake sensorial loss of energy for vascular loss of balance; and the distinction being easy the mistake should never be made." (p. 349.)

Imagination. The faculty of imagination has a large influence upon disease. When morbid, the individual becomes superstitious and fanatical; he attends to dreams, and to omens; he listens to voices, and receives impulses which have no foundation in reason or religion; he is deceived by hallucinations, and ultimately becomes monomaniacal. As

imagination acts so largely on the hopes and fears, it operates considerably on almost every bodily disorder, and its "judicious management, on the contrary, will often be the means of prolonging or of destroying life. Hence the importance of sedulously watching its agency, and especially of sedulously guarding it from eccentric action." (p. 351.)

Hysteria. Mr. Newnham adduces hysteria, to explain how greatly the actions of the body and mind are perverted by slight and temporary irritation of the brain. In such persons the nervous temperament largely predominates, and a slight mental emotion will, as is well known, " suspend the action of the heart, disorder respiration, produce muscular spasms, alter secretions, cause violent pain where there is no cause for pain, suspend the action of the brain, producing unconsciousness, or pervert its action, as in involuntary crying and laughing, &c." (p. 406); and all this shall pass, and in a few hours, or minutes, the patient is well again, and only feels exhaustion.

Fainting illustrates the same point : the brain fails, from failure of the heart to supply it with blood, and this often from the slight causes acting on the nervous system ; emotion, a disagreeable sight, a peculiar odour, a painful reminiscence.

" A disposition to frequent fainting is not uncommon, though it may not amount to a complete suspension of action; and this is a very painful state, as it tends most entirely to unfit its subject for thought, and other intelligent manifestation ; and yet the patient remains feelingly alive to the change." (p. 408.)

Mental decay. The gradual decay of the brain occurs in different individuals at very varying periods of life,—precociously, in those whose nervous system has been originally feeble, or in whom it has been impaired by intense thought, or anxiety, or domestic misery, or by politics, or by wine, spirits, or opium. But even in the most favorable circumstances, a gradual decay takes place. The individual has at first less power to command attention ; he has to read and reread his author to obtain the meaning, from finding " *he cannot give his mind to it.*" He cannot concentrate his thoughts on any subject; hence his views are imperfect, and consequently he is prejudiced. The consciousness of this loss of power makes him peevish and irritable, impatient of contradiction, and disposed to substitute petulance for argument. At last, power over the brain is lost. The symptoms of decay vary according to the causes, which Mr. N. arranges under six heads.

1. In exhaustion of the brain there is commonly distress about the head, often severe headach with quick pulse, " the pulse of effort," with increased vascular action about the head ; wakefulness ; painful consciousness that the brain requires absolute rest, but with heavy broken sleep, dreaming, and a thousand waking fancies ; study is onerous, and increases the symptoms.

2. Congestion of the brain is marked by torpor, and diminished sensibility ; dull, heavy weight about the head, and often giddiness ; pulse slow, full, labouring ; general weakness, or prostration of strength ; great sleepiness by day and night ; gloominess, perceptions dull. The brain is benefited by some exertion, even intellectual, but especially by bodily exercise.

3. Loss of nervous power generally from over-action of the brain, is not always dependent on congestion, though sometimes connected with

it; and as at first there is not much visible disease, the patient "very generally gets blamed for something wrong in his *morale.*"

"Thus indolence of manner and conduct is often ascribed to the want of mental industry; he lies in bed when he ought to be up; he will be found indolently lounging upon his sofa, when he ought to be studying; the letter-writing of to-day will be postponed till to-morrow, as will the ride, the walk, the errand of charity, the business; there is an absence of interest in all he says and does; he appears to want the proper amount of social feeling, and he is inattentive to the wants, the desires, the entreaties of those around him. By-and-bye, cerebral malady stands out in full force; the cause of all this alteration of character becomes acknowledged; the disease leads to much physical infirmity, and to the gradual extinction of life." (p. 417.)

Mr. N. calls this condition of brain "*sensorial torpor.*"

4. "Precisely opposite to this state is the form of *irritable brain.* This seems dependent upon some preceding unwonted action, during which the fibre is rendered too susceptible to impression, and the brain has not power enough to control that irritability. He feels excessively the merest trifles—he is quick, irritable, irascible, prone to take offence, and always on the *qui vive* for something to awaken this irritability." (p. 417.)

5. The state of the brain may depend on the alteration in the general mass of blood, without any decreased action in the brain itself, but merely that slow or increased vascular action which is compatible with ordinary health. If the vascular action is excited, the ideas flow rapidly, imagination is more fertile, perception more acute, the feelings intense, the judgment more accurate, and if this state is preserved within the line of health, good is produced. But it is a dangerous excitement, often followed by a sluggish action of the veins, from their having been over-filled, and gradually losing their power of getting rid of the blood in due time for the next quantity. In time, the arterial action becomes accommodated to the slow venous movement, and the mind becomes torpid,—drowsiness, general languor, indifference, and distaste for thought, and a feeble, hesitating, ever-changing judgment.

6. Lastly, a form of nervous irritation, accompanied by an apprehension of impending evil. The patient is "exceedingly nervous, absurdly fearful, as it might be called; too diffident to act, too distrustful to be firm; too wavering to be relied upon, and with a prevailing expectation of future evil, that evil varying from the common ills of life to the highest evil, exclusion from the hope of forgiveness, of happiness, of heaven."

All these states are liable to spectral illusions, to hallucinations, and to insanity.

Mr. N. alludes to a form of cerebral disorder, "when some distant irritation ceases all at once, and is converted into cerebral malady assuming the form of hallucination. If the original malady can be reproduced, the secondary evil will probably be relieved; but when this cannot be the case, it remains oftentimes permanently." In all hallucinations the brain "has escaped the province of reason," arguments are unavailing, the only remedy is to treat the morbid action in the brain.

Insanity. Mr. Newnham next passes to insanity, and remarks on the disadvantages of calling it a mental disease, as contradistinguished from bodily disorder, and very acutely shows that, making allowance for the organ affected, it differs in nothing from other diseases.

" There are the same period of incubation—the same premonitory symptoms of disorder—the same transient and slight derangement of function—the same march of fully-formed disease—the same advance and decline, marked, as in other maladies, not by constant progression, but by occasional advances and retrocessions—the one being greater than the other, according as the malady is loosening its hold, or narrowing its grasp upon the system, and always being marked by this one feature—that in the former case, the entire ground gained is never wholly lost; and in the latter, that the entire ground lost is never wholly regained ; exacerbation and remission, called, in the case of insanity, paroxysm and lucid interval, are always to be found.   Add to these points of similarity, that its terminations are the same; these being in restoration to health, which leaves the patient just as before the invasion of disorder; or by some other form of malady which seems to prove critical of the more important disorder ; or by some alteration of function which leaves the original integrity more or less impaired ; or by some change of structure, marked by increasing disturbance ; or by the substitution of disease and such organic changes as are incompatible with restoration to health ; or by complete loss of power, as in idiocy or atrophy; or by the gradual and complete extinction of life." (pp. 429-30.)

The treatment is the same, to discover and remove the cause—" subduing inordinate, or rousing languid vascular action," soothing irritation by giving sympathy, consolation, hope, and confidence ; removing perverted trains of reason, and replacing them by correct ones.   The necessity of patience is insisted upon.   The strength of the morbid convictions depends on the patient's dwelling on an idea so constantly, that it becomes fixed, and the patient a monomaniac ; and, for its cure, line upon line, precept upon precept, must be " judiciously employed, keeping in view the fact, that great changes are not to be effected in the nervous system except by time, and a frequent repetition of the means employed."

The boundary between actions arising from physical infirmity and from moral guilt, is defined with difficulty.

" Until we possess a better *test*," says Mr. N. charitably, " we may take this as our criterion. . . . Whatsoever is willingly, determinately, considerately, and deliberately done, must, if it be *wrong*, be placed to the score of *moral wrong :* and that wrong which occurs without the support of the will, independently of it, and even in opposition to its general bearing, may be allowed to partake of the nature of physical infirmity." (p. 433.)

In a healthy mind and brain the will has supreme power, commanding and changing the course of the thoughts.   In insanity this power is lost.

" Hence arise uncontrolled thoughts ; images over which the judgment has no influence ; imaginations without foundation ; impulses not to be accounted for ; apparently sound reasoning upon false premises ; constant change of purpose ; action without definite object; disproportioned will, sometimes earnest over trifles, and almost nothing over objects of primary importance. . . . Hence arises the great analogy between insanity and dreaming." (p. 434.)

Religious insanity.   Mr. N. treats at some length of the influence of religion on insanity.   He combats the notion that religion, properly so called, can produce insanity.   Religion, as " the best preserver from the influence of the animal passions—the best regulator of the affections, and the surest guide through the difficulties of life, affords the best security for the tempest-tossed brain, to those who obey its precepts."   But in a brain *predisposed to insanity*, in which a strong emotion will overturn its

integrity, religion may be said to produce insanity in two ways.   1. By its natural influence, as setting before a man the highest hopes and greatest fears, involving future happiness or misery. And when an individual predisposed to insanity, and who has for many years been careless about these things, earnestly turns his attention to them, it is not surprising that the subject engrosses him, even exclusively.   This exclusive attention keeps up one set of impressions, and the reason is overturned. 2. By its unnatural influence, when the predisposed individual takes up false notions of an implacable God ; " when he contemplates himself as predestined to misery, and when he loses himself in the mysteries of election," an exclusive and depressing impression is produced, and is followed by one of the most fearful forms of insanity, and religion thus works like the passion of love, especially when unrequited ; like too much business to the merchant ; like ambition, or political trials ; the brain is morbidly impressed in all, the impression becomes exclusive, and the man insane.   This pseudo-religious insanity may be divided into the hopeful and the desponding.   In the former state, the maniac is full of his own self-importance, and of some extraordinary commission which he is to accomplish.   In the second, he is without hope, and can receive no comfort, and this is often caused by false views of religious belief : substituting for that cheerfulness with which a right view of religion invests its believers, " a mysticism which makes it fearful." (p. 458.)

Temperament has a considerable influence over these states. The sanguine temperament inclines to hope, the melancholic to despair. In illustrating the effect of the mind upon the body, Mr. Newnham gives the following anecdote which occurred within his own circle :

" Three brothers entered into some most successful speculations, and realized very large profits ; but they continued the speculation ; one bargain more ! and now the tide had turned ; the article they had bought had been carried up by speculation to an unnatural height, and they could no longer sell except at a loss ; they still hoped for a favorable reaction, but depression was the order of the day ; to save their credit they must sell ; they could only do so at a ruinous sacrifice ; they could not meet their responsibilities ; next morning one had died by his own hands ; another was seized by apoplexy, and lived only a few hours ; the third died in a few months from ulceration of the stomach.   Insanity had been rife in the family." (p. 472.)

Mr. Newnham discusses those cures, such as Prince Hohenloe's, which seem to be effected by the entire faith of the patient in the miraculous powers of another:

" Their experiments were never made upon a deaf and dumb person, upon a case of blindness, produced by disorganization of the eye, from spinal deformity, from destruction of the bodies of the vertebræ, upon the loss of a limb, or upon a disorganized joint.   The cure was limited upon that class of chronic diseases which depends for its characteristic intensity upon a peculiar laxity of the nervous fibre ; a fact of primary importance, since it shows the influence of mind upon the bodily functions and structure in the cure of disease." (p. 481.)

In these cases in general, the effect was palliative only ; it was " curative in those instances in which nature, or antecedent treatment had already effected a cure, and excitement alone was necessary to give energy to the weakened organs."   The influence of mind (Mr. Newnham says,) can effect no permanent cure of any organic structural alteration.

Announcement of expected death to patients.   In practice there is

a subject of difficulty, delicacy, and importance which it is necessary that the medical attendant should have thoughtfully considered before he is called upon to act; and that is as to acquainting the patient with his danger. Mr. Newnham discusses this like one who has duly weighed an important question, and who has often put his thoughts into action. We refer those readers who wish to see this point practically discussed by a religious man to the volume itself: those who are of a similar disposition of mind, (and to those chiefly such observations are of service,) will find many special directions and hints for their guidance. We must confine ourselves to a short summary of the argument. It is the first duty of the medical attendant to preserve life. In this purpose confidence of the patient in his physician and in the remedies employed are of great service; so are hope and cheerfulness. On the other hand, a patient under such circumstances must not be deceived. The question is therefore as to the mode of communicating the intelligence. A hasty or brusque manner of revealing danger might at once kill the patient. The rule is " to speak the truth yet cheer the sufferer." In dangerous acute diseases, where the powers are sinking, to acquaint the patient with his danger would increase it without any compensating good. The patient is too much occupied with disease to think at all, or to think correctly. It is to chronic diseases that the question applies; in such there are many opportunities to lead a patient to the consideration of the uncertainty of life, to the frequent fatal issue of disease, the necessity of preparation, and the wisdom of making provision for the worst, even whilst expecting what is better, (see p. 496, et seq.) Such subjects should be introduced with delicacy and at proper opportunities; their injudicious management is very mischievous. If the patient inquires as to the probable issue of his disease, the best mode is to review candidly and honestly the usual progress of such a complaint, and the peculiarities of his individual case, and whilst giving all the hope which such peculiarities admit of, yet concluding that where there is uncertainty the safe course is to act for the best, but to be fully prepared for the worst; the course of a prudent man in the common evils of life.

Temperament. Mr. Newnham next considers the influence of temperament upon the mind.

1. *The sanguineous temperament,* marked by florid complexion, blue eyes, fair skin, light and often red hair, animated countenance, active and easily-excited circulation, firm and elastic muscles. Its disorders are accompanied by high action and power, so that it will bear exhausting remedies better than any other. The vis medicatrix naturæ is marked. The character of mind is similar, active and powerful, impressions received are lively, memory good, rich and lively imagination, fondness for society, benevolence and ardour; on the other hand it has its mental evils: irascible, easily provoked, disposition volatile, so that deeply-expressed sorrow is speedily followed by calm self-complacency, not persevering, fondness for novelties, friendships and hatreds of short duration. The cerebral diseases are of the same character, violence rather than depression, mania not hypochondriasis; in all there is always a certain degree of joyousness, self-content, and self-esteem.

2. *The bilious or choleric temperament,* marked by dark hair, eyes, and complexion, dry skin, strong muscular fibres not disposed to as much

exertion as the sanguineous, but capable of longer effort ; much mental power.   The best literary characters are found in this temperament, from its constancy and perseverance.   There is less quickness of mind, but greater solidity and depth ; more attention to books than to persons ; not the same fervour of affection, but greater constancy and greater self-denial to do good to the object ; less agreeable, but more to be relied on; cautiousness and firmness.   It is liable to bilious headachs, arising most frequently from the head, with which the stomach sympathises ; subject to venous congestion of organs, especially of the head rather than high arterial action ; it will not bear very active remedies ; more liable to chronic disorder, "inasmuch as venous congestion takes place slowly, at first without exciting much notice or general disturbance, and thus the way is prepared for alteration of structure."   Its mental peculiarities may become morbid from excess : its unchangeableness, prejudice ; its consciousness, bigotry ; its firmness, obstinacy ; its caution, suspicion ; its reserve, (a concentration into self,) unamiable ; its courage, temerity ; its fondness for reading may take off the man from the duties of action to the pleasures of abstraction ; too great a disposition to find fault with the world.   In its insanity there is a disposition to gloom ; to look at the dark side of everything ; to be weary of life ; to believe that you are the sport of evil spirits and forsaken of God ; and to self-destruction.   This tendency to suicide in those of a peculiar temperament is not brought forward (says Mr. Newnham) to prove that one who commits suicide must be insane.   The case is widely different from that brought on by moral despair, by acts and conduct of his own ; when a man has lived a life of self-gratification, or of immorality, and when with a ruined fortune and a worn-out body he sees nothing but misery in the world, and futurity a blank ; or when a man has lived a life of thoughtless extravagance, beggared himself and his family, and sees inevitable ruin before him ; or when after diligent prosperity in business he is reduced by an unexpected reverse, and has no high principles to support him ; or when the victim of seduction cannot bear the exposure of her shame—" in all these cases suicide is not insanity."   It is a wilful error.

We give this argument, but still feel the difficulty of its application. In many such cases there may have been a disposition to insanity, which these causes have suddenly brought into activity ; and therefore the act of suicide may be pronounced an act of insanity, without any justification of the previous causes which led to it, for then the individual is of course morally responsible ; but the jury or the witness have to inquire into the sanity of mind at the moment of committing the act ; and where there have been any previous symptoms of insanity, or any suspicion of an hereditary tendency to that disease, however culpable in a moral point of view may have been the individual's conduct, and however it may have tended to encourage the development of cerebral disease, we think the jury are justified in leaning to that construction of the Act which is the most merciful.

3. *The lymphatic temperament*, marked by a prevalence of the white fluids and of general feebleness ; a pale and thick skin ; great softness of muscle ; soft light hair ; soft, languid, light eyes ; thick lips, which give the appearance of the mouth being half closed ; and feebleness of character as well as of structure.   It is liable to consumption and all forms

of scrofula; and in all its disorders feebleness and inability to support action are characteristic, and when morbid action has commenced there is little chance of arresting it. Its mental characteristic is action without power to support it; as exemplified in precocious children. If called on for much exertion, the mind wears out the body and itself. So it is with the affections and passions of this temperament; a certain vehemence which cannot be sustained. A greater proportion of fools, idiots, and those with feeble minds among the insane belong to this class.

4. *The nervous temperament* is marked by its great susceptibility of impression and mobility; this restlessness keeps the individual thin; there is great changefulness of countenance; sudden animation, but often an expression of languor very distinctive. The influence of emotion may be sudden, and appear to be deep, but the feeling is quickly superseded by a new one, to be replaced by a third. Its diseases have a similar character, as the protean forms of hysteria indicate.

Temper. In alluding to the influence of the internal condition of the abdominal viscera on the mind, Mr. Newnham makes an acute remark on the *temper* which is worth remembering. Every one is sensible how much his mind varies with the stage or condition of his digestion, and that ill temper, moodiness, and irritability often proceed from the same causes. Such manifestations of ill temper, however, are usually kept as *home* disagreeables, the same man abroad being all smiles and kindness; hence it is evident that the will is successful in resisting their agency; and if the mind is capable of overcoming their organic suggestions, it is bound to do so at all times.

Changes of opinion are next discussed. The natural and healthful are of course the result of increased knowledge and wisdom; but there are others which depend on conditions of the brain, independent of this increase of wisdom. By morbid changes Mr. Newnham intends those which without adequate cause are at variance with the individual's former self; a sudden perversion of character, which throws an air of strangeness "over the whole mind; a perversity of thought and feeling, which needlessly gives undue prominence to certain points; an inaccessibility to reason and conviction," all at variance with common sense, and opposed to his previous views—a state bordering on insanity.

Temperament and religion. We next come to *the influence of temperament on the expression of religious feeling.* Religion consists in the service of the intellect as well as of the feelings; but there are two kinds of religionists, who seem to think that but one of these faculties is alone employed. The one whose religious feeling consists in a species of quietism, the belief of being a passive agent in the hands of Providence, having every event arranged and every feeling prompted by a spiritual influence, and of having nothing to do but to wait; and this character is alone found in the peculiar form of melancholic temperament. The opposite error is the religion of the head only, consisting in a love of contention for doctrines; bustling and overweening outward activity, especially in public; much talking without feeling, &c.; and this is found in one form of the choleric temperament. Not that such peculiarities may not arise from mental causes, but that a religionist, who has a strongly marked melancholic temperament, will exhibit such traces of its influence. Religion itself is not altered, but "the expression of religious feeling is characte-

rized in no small degree by physical temperament." This assertion is illustrated by a sketch of the different effects produced by religious impressions on two individuals of opposite temperament. The individual of sanguineous temperament, when first he begins to think seriously on religion, is disposed to hope and to be joyful; the melancholic to despair from his past conduct; the former proclaims openly his change, the latter distrusts himself and conceals it, though equally sincere. The former becomes foremost " in all the bustling activity of charity," the latter, with no less sincerity, is less ostentatiously useful. In sickness, the former, whose character depended so much on health and on the integrity of his nervous system, becomes irritable and repining from his suspension of his activity. It is easier to do than to suffer; occupation is favorable to strength, and gives energy and confidence; but take away this prop, and patient endurance is exceedingly difficult. This is a physical condition, and there are few who have not experienced the benefit of walking or riding when wearied, worried, or perplexed. On the contrary, the person of melancholic temperament, who in health had less appearance of religion, now exhibits its real influence. Always accustomed to struggle against constitutional melancholy, he will not be depressed, he is patient, and submits from a conviction that all is for the best. The same distinction will appear at the approach of death. Supposing that both are dying of the same disease, the man of sanguineous temperament is full of hope and confidence; he of melancholic temperament has many fears and occasional doubts, although unshaken in his religious faith. Both have been influenced by the same principle, although their actual feelings, and more especially the expression of those feelings, were dissimilar.

On the same principles is explained the zeal and enthusiasm of one class, and the quiet steady pursuit of religion of another.

" Constitutional tendency, and physical temperament will often account for that which perhaps might be called wordliness by one class, which class would in the views of the former be considered as remarkable for cant. Hence the former should not be regarded as irreligious, nor the latter as hypocritical."

Prayer. Some very good persons are distressed at their inability at times to pray. But this may depend on the body, as is shown in the same individual under a change of physical circumstances. " Only let sickness assail him, especially that which distresses the head : or even great bodily fatigue ; and now an oppressive languor creeps upon the mind, blunts the feelings, distracts attention, perverts perception and destroys that gift of eloquent combination which before might have charmed us, &c." The same observation applies to the power of fixing the attention; in some persons, slight causes disturb the attention, and it will be found that they are equally liable to disturbances in the animal functions, owing to great irritability of their nerves. In such, a trifling bodily ailment interferes with their brain, and serious thought becomes oppressive. After long illness convalescence in such a patient is often attended with peevishness, and impatience from a feeling that he is inadequate to the performance of the duties he most desires, and cannot shake off his weakness, but must wait for a return of bodily strength. There is an opposite condition of the nervous system, where impressions do not easily produce morbid irritation ; protracted suffering does not disturb in a great degree the nervous system, and the mind seems more

independent of the body, and not influenced to the same extent by fatigue or exhaustion. This depends not on the constitution of the mind, but on the soundness of the brain. It is not the weak, but the strong organ of the body. Moral causes may still further strengthen this constitutional gift. Firm judgment, decision, prompt and persevering action, inflexible justice, and above all religion will do much towards establishing this original bestowment; or on the contrary their absence may render it worthless. The power of abstraction from self and surrounding objects, and of fixing the mind on things unseen is in great measure the result of these two causes; a healthy brain improved by mental discipline.

The occasional existence of vigour of mind and increased thoughts just before death has been brought forward as evidence of the immateriality of the soul; but (as Mr. Newnham says,) if this is evidence, the opposite condition would prove its materiality, and this latter state is by far the most frequent. The truth is that such manifestation depends on the health of the brain which may not be affected by the fatal disease, but such instances are rare; the general rule is " that the manifestations of mind are rendered feeble, or obscure, inefficient or perverted, exactly in proportion as its organ may have been subjected to the influence of disease." Many look to a death-bed as a test of the individual's principles. But Mr. Newnham's observation, grounded not on theory, but upon witnessing the death of many, is that " many a feeble Christian expires in trembling doubt, whilst many a careless sinner is remarkable for his calm, or rather his thoughtless dismissal; many a self-righteous pharisee leaves the world with exulting recollections of his own good works." So often is this the case, " that the nature of the malady, and the kind of temperament being given, it will be easy to predicate the peculiarities of the death-bed." Friends should not therefore rest their hopes or fears on the " precarious phenomena of dissolutions, characterized by physical temperament, encompassed by infirmity, and modified by a great diversity of organic irritation," but rather upon the previous life.

Death. The phenomena of death depend on the organ which dies first. If the brain dies first the manifestations of mind are generally obscured and perverted, but there is an occasional exception in cases where just before death, there is a "sudden lightening up," and a display of mental power the more striking from the previous condition. The fact is thus explained by our author;

" These phenomena are referrible to a physiological law that just before the giving way of any organ of the body, there is communicated to it and to the nervous system at large, a temporary stimulus, which gives to the patient a sensation as if the individual failing viscus were actually in a state of high health and vigour. This law may be easily exemplified; and indeed it is well known to all persons who have a weak digestion; under some circumstances, there will be a feeling of comfort and elasticity diffused through the system, and, as it would seem, irradiating from the very organ in fault, the stomach, which to the uninitiated patient speaks a decided improvement of health and strength; whereas, in five minutes afterwards, a consciousness of sinking and debility, and all the other phenomena of indigestion, will proclaim that this organ was only under the influence of temporary excitation, from the actual commencement of that morbid action which was to terminate in failing power." (p. 609.)

Such is a brief analysis of Mr. Newnham's views on a subject most worthy of attention. To the volume itself we must refer those who are

so far interested in it as to wish to see it more fully discussed. Should one
of our readers be disposed to believe that Mr. Newnham has over-rated
the influence of the body on the mind in the exhibition of religious feel-
ings, and to an extent likely to be injurious to a cause which both think
of the greatest importance, we would beg of him to read the book itself,
as its author has fully guarded his views from any such misapprehension,
and our space has prevented our using many of his arguments.   This
last chapter (the tenth) we consider the most original and valuable,
embracing the result of much actual experience on circumstances upon
which a medical practitioner (whatever may be his own personal views or
opinions,) must often have to converse, to decide, to afford consolation under
the most painful circumstances, none of which he can do adequately if he
has not previously made them the matter of consideration.   We need
hardly observe that much which we have quoted should be regarded as
mere statements, the truth of which must be tested by comparison with
actual facts falling beneath each individual's observation.   But although
it may not comprehend the whole truth, we believe there is much truth
in it, and very much which is worthy of consideration.   It is impossible
to read Mr. Newnham's work without the conviction that he has bestowed
very much thought on a large number of important subjects ; and that he
has kept these subjects for a long time before him, turning them over and
looking at them from various points, patiently and perseveringly.   In a
scientific point of view we may regret that he has not aimed at concentration
and compression, and that he has rather endeavoured to make his mean-
ing intelligible by amplification, than by well weighing the exact meaning
of each word ; but still we would wish to keep in view, and to make al-
lowance for his object, which is obviously that very difficult one, to
write a book on an abstruse subject which general readers might under-
stand, and scientific men profit by.   This has been accomplished in the
same department of knowledge, the philosophy of the mind, by a phy-
sician, second to no living man in the diligent and fruitful observation of
disease, although in his advancing years he seems, as a writer, to have
forsaken matter for mind, and certainly for general advantage.   But
Dr. Abercombie has gained the ear of the educated evidently by such
studied brevity, as was consistent with clearness in the statement of
truths in their nature somewhat obscure ; a brevity infinitely more labori-
ous than copious illustration and amplification, and only attained to by
him who has that rare self-command, " the power of rejecting his own
thoughts," a qualification (according to one whose prose was as lucid,
and as concise as his poetry,) essential to a good writer.   But Mr.
Newnham can say with Madame de Sevigné, " chacun a son stile ; le
mien comme vous voyez, n'est pas laconique ;" and if by such a style a
larger number of readers are induced to think on a very important sub-
ject which has never before occupied their attention, and if what is still
better, they become imbued with the charity and general benevolence of
feeling towards others whom they see going astray or at least not walking
in the same apparent path, which this volume inculcates, and gives
reasons for, much good will be effected.   Few will rise from its perusal
without being sensible that on some points their views have become more
clear, and that new trains of thought have been suggested to them ; and
no one can close it without feeling much respect both for the principles
and the abilities of the author.

Art. XI.

1. *Diss. Med. Inauguralis de Cancro Pulmonum.* Auct. E. N. Van
   Kleffens.—*Groningæ*, 1841. 8vo, pp. 72.
   Inaugural Dissertation on Cancer of the Lungs. By E. N. Van
   Kleffens.—*Groningen*, 1841.

2. *Cases of Malignant Disease of the Lung.* By H. M. Hughes, m.d.
   (*Guy's Hospital Reports*, No. XIII.—*October*, 1841.)

3. *Clinical Lecture on Cancer of the Lung, delivered at University
   College Hospital.* By Dr. Taylor. (*Lancet, March* 26, 1842.)

4. *Researches on the Pathology and Diagnosis of Cancers of the Lung
   and Mediastinum.* By William Stokes, m.d. (*Dublin Journal of
   Medical Science, May*, 1842.)

5. *The Physical Diagnosis of Diseases of the Lungs,* (*Chapter relating
   to Cancer of the Lungs.*) By W. H. Walshe, m.d. 1843.

Did space permit, we should almost be tempted by the present fa-
vorable opportunity to enter into a complete examination of cancer of
the lung in its anatomical, pathological, and practical relations. We
should be justified in this course by the increasing interest of the subject,
and above all by the obvious fact that, while its frequency, as a pulmo-
nary affection productive of symptoms, is much greater than had until
of very late years been suspected, it may at the bedside be confounded
with diseases from which it is all-important to distinguish it. Unless a
most careful inquiry into symptoms local and general, and more espe-
cially into the existing physical signs, be instituted, nothing is more likely
than that cancerous solidification should be mistaken during life for tu-
berculous accumulation; nay more, that the error should remain uncor-
rected even at the post-mortem examination, unless the anatomical exa-
mination be most cautiously proceeded with. But for so full an inquiry
as that alluded to, our means are insufficient, and we must therefore
content ourselves with a more sketchy view of the present state of know-
ledge on the subject.

Of the three distinct species of cancer—Encephaloid, Scirrhus, and Col-
loid—which are now admitted to exist, the two former only have been
satisfactorily detected in the lung. Among Dr. Hughes's cases is one,
we are aware, in which some notion appears to have arisen in the mind
of that writer that he had a mass of pulmonary colloid before him; but
he himself admits " there will probably exist considerable difference of
opinion upon the true nature of the case," and his description leads us in
our own persons to realize the prediction. Colloid of the lung we, there-
fore, set down as among the anatomical changes of this viscus which re-
main to be observed. Encephaloid, on the other hand, is of much more
common occurrence than scirrhus.

Dr. Stokes, speaking of the different forms of the disease, enumerates
the following as having fallen under his observation:

"1. Isolated and generally well-defined encephaloid tubercles of a rounded
form, the intervening tissue healthy, and the tumours equally distributed through
both lungs. 2. Isolated masses of irregular forms; sometimes coinciding with
a mass of complete cancerous degeneration. 3. Tubercles of various species

of cancer coexisting, such as scirrhus, the encephaloid and the black spongiform cancer. 4. Simple degeneration of the whole or part of a lung into the homogeneous encephaloid matter. 5. Encephaloid tumours of the posterior mediastinum compressing the lung. 6 The same condition combined with cancerous degeneration and cancerous tubercles of the lung itself. 7. Cancerous tumour of the anterior mediastinum. 8. Tumours of white fluid cancerous matter perfectly encysted, and surrounding the trachea and œsophagus, combined with a white cancerous infiltration of a portion of the lung and cancerous coagula of the bronchial tubes. 9. Cancerous degeneration of the whole lung, with deepseated and superficial ulcerous action, extensively separating the lung from the pulmonary pleura." (Dublin Journal.)

Upon some of these forms of the disease we proceed to offer a few observations.

The first form is that essentially characteristic of secondary cancer not only in the lungs but, as noticed by Cruveilhier, Dr. Walshe, and others, in the liver and bones. These tuberous disseminated masses almost invariably exist in the pulmonary substance, without giving rise to distinct symptoms during life, a fact so generally recognized by writers upon cancerous disease that it strikes us as rather singular to find Dr. Hughes commenting upon his experience to this effect as having some claim to novelty, on the plea that Dr. Stokes out of two or three cases did not meet with the variety in question. The immediate reasons that this form of cancer is unattended with obvious local symptoms appear to be the common existence of severe disease in other parts, acting as a sort of counter-irritant; and the peculiarly healthy state of the pulmonary tissue around and between the nodular morbid masses. Upon what this freedom from disease of the surrounding tissue depends, it is not easy to determine; it adds considerably to the difficulty of detecting the tuberous masses during life.

Dr. Stokes's fourth form of simple degeneration of the pulmonary substance is one which can rather be imagined than understood from the description given by himself, by Drs. Graves, Heyfelder, or Hughes. When Dr. Graves, for example, states that "in place of the right lung was found a solid mass, weighing more than six pounds; it was firm, homogeneous, and its substance resembled that of brain partly hardened by artificial means,"—he gives us no evidence that the pulmonary tissue had actually undergone a process of degeneration and not simply receded before a mass growing external to itself, and above all leaves us utterly in the dark as to the mode of development and advancement of interstitially infiltrated cancerous matter, together with the anatomical appearances of the structure thus diseased. Dr. Carswell's inimitable delineations, which leave so few points in morbid anatomy untouched, and, may we add, unadorned, yet throw no light on the condition at present in question; because, although he has distinctly figured infiltrated cancerous disease of the lung, the morbid matter so predominated over the healthy in the specimen employed, that no idea of the condition of the tissue while undergoing the process of infiltration is obtained from the plate. The case upon which Dr. Taylor's lecture is founded supplies this deficiency in a tolerably satisfactory manner, and we shall extract some portions of the description given by the lecturer:

" The colour of the implicated lung was a dirty, dark-greenish, brown; the texture hardly anywhere crepitant, exceedingly lacerable, yielding to the slightest

traction or pressure; some portions had a granular aspect, others were broken down into a dark-coloured, dirty-looking, semi-fluid pulp; when cut or torn, in most parts the cut surface was speedily covered with a similar fluid; the odour was offensive, but not excessively so; a foreign deposit was copiously diffused throughout the substance of nearly the whole lung; in most places it was in small masses, of a dirty-gray colour, and very much resembling diffused crude tubercle, which it was supposed to be ''

So far the description, though not fairly applicable to ordinary tuber-culization, but apparently referrible in some part to gangrenous tissue, yet portrays none of the characteristic features of cancerous deposition; we are, however, informed further on that, "whilst examining the matter infiltrated through the tissue of the lung, Dr. Walshe observed that its surface in various places had a pink hue and was distinctly vascular, proving that it was not tubercle, and he subsequently ascertained its cancerous nature beyond all doubt by microscopical examination."   It may be well to add, that there was in this case "about the root of the lung, a considerable quantity of encephaloid tissue; rather firm, of a brain-white colour, mixed with black portions (apparently the remains of bronchial glands,) and when compressed, a creamy fluid exuded from numerous points of its cut surface."

Respecting the eighth form of disease referred to by Dr. Stokes, we can only say that the extreme rarity of encysted cancer, either in the lungs or elsewhere, would have justified him in entering into a full de-scription of the anatomical features of the morbid accumulation.

The rarity of ulceration of cancer of the lung is sufficiently attested by the fact that two cases, one observed by Dr. Taylor, the other by Dr. Stokes, furnish the only evidence of the fact as far as we know, to be found on record.   In the curious instance described by Dr. Stokes, the whole organ was converted into a mass, having less consistence than common in encephaloid disease; a large portion of the lung was burrowed by anfractuous excavations, communicating on the one hand with the bronchial tubes, and on the other terminating in fistulæ, running in various directions to the surface of the lung, where they terminated in superficial cavities (containing air and a whitish purulent fluid,) bounded at oppo-site points by the posterior surface of the pulmonary pleura, and by the degenerated pulmonary substance.   The left lung is said to have been healthy, except that it contained "a few small hydatids."   The term hydatid has been so vaguely applied that we wish Dr. Stokes had dis-tinctly signified the species of formation to which he applies the term; if he mean by the word real acephalocysts, the case acquires new interest, for it would appear from the inquiries of Dr. Walshe, (Cyclopædia of Surgery, vol. i. p. 616,) that the association of cancer and these entozoa is extraordinarily rare.

Cancer occurs in either lung only, or in both simultaneously; of nine-teen cases collected by Kleffens six were examples of cancer of the right lung, seven of disease of the left, while in the remaining six both organs were implicated.   But this calculation refers apparently to cases of all kinds, those in which the pulmonary affection was primary, and those where in it constituted a part only of a general cancerous diathesis.   If secondary cases were excluded from consideration, (those cases in which the tuberous masses form the anatomical condition of the disease) we

believe that the proportion of *double* cases would be much lower.   In-
deed in the instance of the disease which came under Dr. Taylor's notice,
the absence of disease in one lung, while the other was affected to a very
considerable amount had its influence in leading that physician to con-
sider the case one of cancer and not of tubercles.   Dr. Hughes, with
some hastiness, for he has but four cases whereon to ground the opinion,
considers the right lung especially prone to the disease ; although pre-
mature, the conclusion may be a correct one, however, for several other
cases might be added to the four in question : Dr. Sims published two;
Dr. Taylor's case, that of Dr. Graves, and two by Dr. Stokes, furnish
examples of the same localization, and Dr. Walshe briefly alludes to
another. (p. 285.)

Among twenty-seven cases collected by Van Kleffens, twenty-two
were instances of the coexistence of cancer in two or more different
organs : in fifteen of those twenty-two the disease existed in external
parts, a circumstance which of course, as has been noted by all writers
on the affection, removes much of the difficulty of the diagnosis.   Van
Kleffens does not state in how many of these cases the pulmonary
cancer was primary.

Females are probably more prone to the disease than males.   Cancer
in general is an affection said to be about three times as frequent in
females as in males,* and may therefore be supposed to affect the lungs
more frequently in them as well as other parts; nevertheless Van Kleffens
found that of twenty cases, thirteen were furnished by males and seven
by females.   The affection has been observed at all ages from twenty to
seventy ; but appears to be most common in individuals aged between
twenty and thirty, a circumstance which agrees with what has been
already said respecting the greater frequency of the encephaloid species
of the disease.

Van Kleffens has analysed the symptoms in a number of cases, vary-
ing in different instances from twelve to seventeen.   In ten cases cough,
he states, is distinctly mentioned ; it is more probable that it was forgotten
by the reporters than absent in the others.   The cough is said to have
been dry in two of these cases; the matter expectorated in the others varied:
mucous and bloody in some ; in a few mucous only or purulent; in not
very rare instances there was actual hemoptysis.   Dr. Hughes lays stress
on the circumstance of the sputa " occasionally consisting of blood, so
thoroughly incorporated with serous fluid as to resemble *red* currant
jelly ;" while Dr. Stokes compares the expectorated matter to *black*
currant jelly.   Dr. Taylor's patient had had hemoptysis ; but swallowed
her sputa while under observation ; the breath was exceedingly *fetid* ; and
a similar state of the sputa, so marked as to require the constant use of
chlorine, existed in a patient whose case has been related by Canstatt.
(Hannov. Annalen, Bd. v. Heft 3, S. 433, 1840.)

Dyspnea, persistent or occurring in paroxysms, has been noted in
almost every case on record, and unless in cases of disseminated masses
through the lung with a healthy state of the intervening tissue might *à
priori* be expected to exist in every instance,   Yet that it may be com-
pletely absent, neither attracting the attention of the medical attendant,

* The proportion is, however, not precisely this ; at least, according to the calculation
of Dr. Walshe, females in England suffer only two and a half times as frequently as
males.   (Cyclopædia of Surgery, vol. i. p. 626.)

nor exciting complaint on the part of the patient, is sufficiently proved by Dr. Taylor's case. But we cannot think this physician justified in attaching any importance to such absence of dyspnea as distinguishing the disease from pleuritic effusion. As his own language shows him to be aware, dyspnea may be totally absent in cases of very considerable liquid collection ; and we venture to affirm that it will be more frequently absent in such cases than in those of cancerous infiltration.

The subject already referred to, who came under the observation of Canstatt, suffered no pain ; in the great majority of instances this symptom is noted, in some of them described as severe and darting, in others as associated with pain in the shoulder of the affected side ; in one case (recorded by Heyfelder,) assimilated to electric darts passing from the false ribs and sternum to the spine. Dr. Stokes enumerates among the symptoms " important as indicative of this disease, pain of a continued kind," and elsewhere speaks of his inclining to the diagnosis of cancer in a case under his observation, in consequence of the patient's suffering under " a violent attack of pain in the side, the pulse remaining natural."

Facts are wanting to determine whether the alleged *characteristic* sputa may in reality be considered to have this signification. As to the other symptoms above briefly passed in review, their absolute want of diagnostic importance needs not to be insisted upon. In respect of symptomatology, indeed, the cases hitherto published are with rare exceptions singularly imperfect; some of those reprinted by Van Kleffens are in the happiest " old school" style of laconic unmeaningness.

With physical signs the case is fortunately different. There are few affections of which the auscultatory and other physical evidence has been established, upon so short an acquaintance with the disease, with any approach to similar accuracy, a sufficient proof that these signs must in their modes of succession or combination, if not in their nature, possess some tolerably distinctive peculiarities. And this is not a matter of book-learning; the affection has been successfully diagnosticated in not a few instances, and with each new case almost some additional particulars, of a kind to facilitate its future diagnosis, have been ascertained. In examining this part of the subject we shall take the synoptical view of the signs of cancer in Dr. Walshe's recent work as our guide, and in our comments thereon, avail ourselves of several of the observations of that writer, of Dr. Stokes, and of Dr. Taylor.

There is an important distinction to be established between different cases of cancer, derived from the condition of the walls of the chest. This distinction was, we believe, first seized by Dr. Stokes, and depends upon the existence or absence of dilatation of the affected side, while this in its turn furnishes some clue to the form in which the cancerous matter is deposited. Dilatation, in truth, never occurs when the cancerous substance is infiltrated through the pulmonary tissue : but may be absent or present in cases of the tuberous form according as the masses accumulated are of limited or of considerable bulk. We have thus one class of cases of " infiltrated cancer of the lung ; alone or combined with tuberous cancer, but not to such extent, as to cause dilatation of the side ;" and a second of cases of " tuberous cancer of the lung or pleura, with dilatation of the side." Of the first class Dr. Walshe enumerates the signs as follows. Signs ascertained by

" Inspection : *Retraction of the affected side ; diminished motions of expansion and of elevation ; diminished costal motions ;* intercostal spaces deeper than natural. Application of the Hand : *Vocal and tussive vibration diminished in intensity.* Mensuration : *Semicircular measurement diminished ;* deficient increase of width during inspiration. Percussion : *Sound intensely dull,* and of short duration ; *resistance of walls marked ;* special character of sound tubular in some cases about the edges of the infra-clavicular and also the mammary regions ; the limits of the dull sound natural beyond the middle line in some cases."

So far the signs apply to infiltrated cancer previous to, or after the occurrence of softening ; the remaining signs differ according as this change has or has not set in.

" (*Before softening of the cancerous matter.*) Auscultation : *Respiration of diffused blowing type strongly masked,* [marked ?] or with progress of disease (which leads to obstruction or obliteration of the bronchi,) *weak or almost suppressed,* retaining, as long as it exists, its blowing or bronchial character ; *respiration exaggerated on healthy side ; bronchophony ; bronchial cough ; heart's sounds transmitted with increased intensity.* (After softening of the cancerous matter.) Percussion : *Sound may become somewhat clearer, and the resistance of the walls diminished.* Auscultation : *Cavernous respiration ; mucous, cavernulous or cavernous ronchus.* Situation of surrounding parts : *Mediastinum,* more rarely the heart, *detruded to the opposite side; corresponding division of the diaphragm, with its subjacent viscera, may be depressed.*" (p. 140.)

Retraction of the affected side is a sign of considerable importance ; in itself alone it would be enough to distinguish a case of cancerous infiltration from pleurisy with effusion in its earliest stages. Pleurisy of longer duration, in which the process of absorption had made some progress, and a diminution of bulk of the side become slightly apparent, might bear some resemblance to the case in question ; but it is remarked by Dr. Taylor that " many of the intercostal spaces would generally be obliterated" in the pleuritic affection, whereas they are more marked than natural in the cancerous ; the signs derived from inspection would consequently suffice to distinguish the cases, were it necessary to limit our investigation to those signs.

In Dr. Walshe's enumeration of the signs appears " *diminished* vibratile tremor of the voice," and the majority of published cases, especially that of Dr. Taylor, the most precise yet recorded, bear witness to his correctness in including it among them. Indeed there is only one case before us in which an increase of tactile vibration is said to have been perceptible, and here some anatomical peculiarity probably existed to account for the exceptional occurrence. We are among those, however, who believe that vocal vibration is a sign often fallacious and seldom of real importance : a very similar opinion is expressed by Dr. Walshe in the work before us, warranted, he states, by his own experience and certainly, beside this, by the marked contradiction he has shown to exist in the doctrines taught by various writers respecting it.

The intensity of the dull sound over lungs affected with cancerous degeneration appears to have impressed itself more or less strongly upon all these authors ; and two of them have particularly commented upon the extremely marked sense of resistance experienced by the finger on percussion. Dr. Walshe has found this so great that it was " almost painful to use the finger as a pleximeter ;" Dr. Taylor seems to consider it greater than could occur in pleurisy, and therefore not without its utility

in distinguishing the two species of disease. But one of the conditions of the sound elicited by percussion in Dr. Taylor's case resembled very closely, or was identical with that observed in certain cases of pleurisy, with contraction of the side, the resonance was amphoric, metallic, and like that produced by striking an empty bottle with an open mouth. Our attention has recently been arrested in two or three cases of chronic pleurisy by this condition of the sound of percussion ; and although sufficiently analogous to the tympanitic, yet it cannot by an attentive observer, at least when put upon his guard, be confounded with that description of resonance.   The same phenomenon is observed in certain cases of pneumonia, and depends upon the bronchial sound of percussion being transmitted, unaltered, by the consolidated pulmonary substance ; such at least is by some admitted to be the true explanation, although we find that Dr. Stokes advocates the notion of its depending upon effusion of air into the pleura.

The conditions of the respiratory murmurs in this disease are remarkable.   At first possessing a most strongly marked bronchial, tubular or blowing character, they have been observed to become gradually weaker and weaker with the progress of the disease.   The explanation of this increasing weakness tendered by several of these authors is that diminution of the caliber of the larger bronchial tube leading to the part interferes with the entry of air ; in a case by Dr. Graves this change would appear to have afforded an insurmountable obstacle to respiration, for we are informed " the tracheal respiration in the front of the lung soon *disappeared*."   The bronchial respiration appears to be in itself an important sign, as its intensity is stated to be much more marked than in any other affection except pneumonia.

The existence of strong puerile respiration in the unaffected lung, (when one only was implicated,) has been noted in several instances.

After softening has commenced in the cancerous matter, the auscultatory signs may be supposed, necessarily to undergo change.   But experience so far permits us scarcely to venture any very fixed opinion as to the nature of the new phenomena. Dr. Taylor's and one of Dr. Stokes's cases appear to be the only ones on record in which they were carefully reported ; but they must have much more frequently been observed, although their real cause had not been established. The signs are those of softening of tubercle, liquid ronchus assuming the cavernous characters and cavernous respiration as the excavation proceeds.   It is fortunate for the facility of diagnosis that ulceration is not common in these cases ; or at least that it is likely seldom to have set in before the patient submits himself to medical treatment.   And for this reason, the combined physical signs under this condition of the disease bear a much stronger similarity to those of tubercle than previous to ulceration ; Dr. Taylor in framing his opinion respecting the nature of the affection before him, (this was before any signs attributable to softening had become audible,) inclined to the diagnosis of cancer, because, among other reasons, " if the whole lung were condensed by tubercles, some of them would probably have begun to soften and given rise to more or less muco-crepitant ronchus."

It will follow from what has been said that the thoracic ordinary physical signs of this disease are at the least tolerably distinctive ; there are

some other physical conditions indicative of tumour, commonly to be detected, and when these, besides the phenomena already described, exist, there can be no doubt of the nature of the malady. They are stated as follows by Dr. Walshe :

" 1, Enlargement and extreme congestion of the jugular, axillary, mammary and superior epigastric veins ; 2, A notable difference in point of fulness between the two radial pulses ; 3, Œdema of the affected side, corresponding arm and side of the face ; 4, Fulness of the neck ; 5, Prominence of the eyeballs, which, combined with the condition of the neck and face, gives the patient the appearance to a certain extent of a strangled person ; 6, Dysphagia ; 7, The existence of tumours in other parts of the body.''

All these appearances (except the last) clearly depend upon venous obstruction, and will be present or absent according as such obstruction does or does not exist : in Dr. Taylor's case they were absent. The growth of tumours in other parts of the body has been of great service in diagnosis in many cases. " One of the most interesting circumstances in this case," says Dr. Stokes, in commenting on a narrative by Heyfelder, "was the growth of the external tumour during the last period of the patient's illness ;" a similar phenomenon was observed in the case published by Dr. Graves, in which, towards the close of the disease, three tumours appeared, and increased with great rapidity.

It is observed by Dr. Stokes that in the advanced periods of the disease, as in aneurism, gangrene of a portion of the lung may supervene. Dr. Stokes adds that it has been shown by Dr. Macdonnell that from the anatomical disposition of the arteries of the lung, pressure upon any part of the main bronchus might cause the death of the lung ; of course, as is observed by this writer, the liability to this is greater in the case of mediastinal tumours than in the simple degeneration.

We have next to consider the signs of " tuberous cancer of the lung or pleura with dilatation of the side :" we shall again extract from Dr. Walshe's volume.

" INSPECTION : *Affected side, expanded or affected with bulging inferiorly ; intercostal spaces widened, flat or even convex ; motions, both general and costal, abolished completely ; fluctuation never visible in intercostal spaces.* APPLICATION OF THE HAND : *Surface unnaturally smooth and even ; vocal and tussive vibration abolished : neither simple fluctuation* nor peripheric fluctuation *to be detected ; pulsatile vibration sometimes present.* MENSURATION : *Increase of semi-circular measurement of the side ;* width of side unaltered by respiration ; *antero-posterior diameter increased ; vertical measurement increased :* distance between the nipple and median line greater than on the opposite side. PERCUSSION : *Sound completely and most extensively dull and of short duration ; resistance of walls extreme ; limits of the dull sound not altered by changing the position of the patient.* AUSCULTATION : *Respiration of the diffused or tubular blowing type, intensely developed in some cases ; ronchi either absent or those of co-existing bronchitis ; bronchophony sometimes so intense as to amount almost to pectoriloquy ; bronchial cough ;* heart's sounds transmitted with unnatural intensity ; double additional pulsation with blowing murmurs sometimes heard also ; exaggerated respiration on the healthy side. SITUATION OF SURROUNDING PARTS : *Heart and mediastinum detruded to the opposite side ; corresponding division of the diaphragm depressed with its subjacent viscera,* sometimes to a very great amount." (p. 141.)

The general similarity of the signs here displayed to those attending pleurisy, with a large amount of effusion into the chest, will not fail to strike the reader. Nor is it wonderful that this similarity should exist, so closely analogous are many of the circumstances of the two cases.

But the nature of the materials causing dilatation differs; in one instance they are fluid, in the other solid, and hence are derived some peculiarities in the signs of each affection. Thus, as Dr. Walshe observes, simple fluctuation in the pleura will be invariably absent, and " in all probability, even in cases of the most diffluent encephaloid, *peripheric fluctuation*" similarly wanting. With this last-named phenomenon, as a sign of pleuritic effusion we confess ourselves hardly familiar; but from the description of the manner in which it is to be obtained, we are inclined to admit that it will not be detected in encephaloid disease, however softened the mass may be. At present, however, we agree with Dr. Walshe in the propriety of making a question of its invariable absence. The resistance of the walls under percussion will be more intensely marked when the morbid accumulation is solid than liquid; upon this point we have already spoken. The blowing respiration heard in cancerous cases will always far exceed, both in intensity and in extent, that sometimes audible in cases of fluid collection; such at least appears to be the opinion of several of these authors, and we perceive no reasonable ground of dissent. Dr. Walshe insists also upon the intensity of the bronchophony commonly discovered, and the total absence of ægophony; we must confess that, although this observer is justified by the records of some few cases in admitting the existence of ægophony in rare cases of *abundant* pleuritic effusion, we consider such cases too purely exceptional to be taken into account. The unnatural distinctness with which the heart's sounds are transmitted, and occasionally the existence of pulsation in the lung, as in cases of Dr. Sims and Stokes, will tend further to guide the physician in his diagnosis. This pulsation is however by no means a constant occurrence in cases of carcinomatous tumour. Dr. Stokes, who drew the attention of observers to it, was doubtful whether in the instance met with by him, " the pulsation was from the vessels of the cerebriform mass, or communicated by the pulmonary artery." He states that he strongly inclines to the latter opinion; yet the vessel seems scarcely to have been in a condition to have produced such pulsation, " the trunk of the pulmonary artery was compressed and flattened, its section presented an elliptical form, and its caliber was so much diminished as to admit only a full sized catheter." (Diagnosis and Treatment of Diseases of the Chest, p. 379.) In addition to the differences now passed in review, it must be remembered that in many cases of cancer, the signs of compression of the thoracic vessels and of the œsophagus already enumerated are present; whereas, as far as experience goes, those signs are never produced in empyema, no matter how extensive.

Upon the treatment of this affection, authors have not yet spoken: their discretion is laudable.

Before leaving this subject we would direct the attention of our readers to one of Dr. Stokes's cases, that of " ulcerated cancer of the lung with extensive separation of the pleura ;" we could not succeed in condensing it effectually and it is too long for extraction. Suffice it to say, that so extraordinary were the physical signs, that various persons who examined it, (Dr. Stokes himself " never ventured on giving a diagnosis,") conceived it successively to be phthisis; chronic pneumonia with ulceration; empyema and pneumo-thorax ; hernia of the abdominal viscera through the diaphragm ; and emphysema of the liver !

ART. XII.

Θεοφιλου Πρωτοσπαθαριου περὶ τῆς τõυ ἀνθρώπου κατασκευῆς, βίβλια ὲ.

Theophili Protospatharii de corporis humani fabrica, Libri V. Edidit GUILIELMUS ALEXANDER GREENHILL, M.D.—*Oxonii e Typographæo Academico,* MDCCCXLII.

The Five Books of Theophilus Protospatharius on the Construction of the Human Body. Edited by WILLIAM GREENHILL, M.D.—*Oxford,* 1842.   8vo, pp. 444.

IT so seldom happens that we have to announce to our readers a new edition of an ancient medical work from the press of this country, that we are induced to devote more consideration to the publication at the head of this article than we would otherwise have been disposed to bestow upon it.   Indeed, since Wigan's edition of Aretæus, Oxon. 1723, as far as we can recollect, no edition of any Greek medical author, and certainly none that has acquired any considerable share of literary celebrity, has been published in Great Britain.   This can be accounted for only by the indifference with which the ancient authorities in medicine have been regarded of late by the profession in general ; and this neglect has now become so great as sometimes to manifest itself in a way which we cannot but apprehend must exhibit the present state of our medical literature to our continental neighbours in a very unfavorable light.   To give an example which presently occurs to us :   Sir Astley Cooper states in his Surgical Lectures that in former times, (meaning seemingly in the days of his immediate predecessors,) the medical profession was utterly unacquainted with dislocations at the hip-joint ; and he makes mention of a surgeon in London about fifty years ago, who denied the possibility of such an occurrence.   The inference which seemingly he wishes to be drawn from this statement is, that all the important information which the profession is possessed of relative to this class of accidents has been derived entirely from himself and his contemporaries ; and if this was his object, it must be admitted that he has been very successful in attaining it ; for we have seen it repeatedly stated in the journals of the day, among the important improvements in surgical practice introduced by this surgeon, that he has the merit of having first made the surgeons of London acquainted with dislocations at the hip-joint.   But the assertion of Sir Astley Cooper must surely have been rashly made, and upon some misapprehension.   For we cannot bring ourselves to believe that the magnates of our profession in London can ever have been so destitute of all proper acquaintance with preceding authorities, or have been so miserably deficient in all talent for practical observation, as we must suppose them to have been if the statement made by Sir Astley had been wellfounded.   In fact we have every reason to think that at no previous period did the neglect of ancient authority prevail to so great an extent as at present, and that at no other time would this assertion of Sir Astley's been passed so long without exposure.   Be that, however, as it may, it ought to be generally known, that the four common varieties of dislocation at the hip-joint, namely, *outwards* on the dorsum of the ilium, *inwards*, upon the thyroid ligament, *backwards* upon the tuber ischii, and

forwards upon the ramus of the pubes, are as well described by Hippo-crates, and after him by Galen, Oribasius, and Paulus Ægineta among the Greeks; by Celsus among the Romans; and by Albucasis, Rhases, Haly Abbas, and Avicenna among the Arabians, as they are by Sir Astley Cooper himself, or by any other medical writer of the present day. If the reader will consult the Venetian edition of Galen's works, or the edition of Oribasius, published among the *Medicæ artes principes* by H. Stephens, he will find drawings of these dislocations executed with no contemptible degree of accuracy. Thus much in regard to the im-portance of cultivating an acquaintance with the ancient literature of our profession.*

The Greek treatise of THEOPHILUS was first discovered about the year 1536 by Franciscus Frigimelius, and was published in Latin at Venice the same year by his pupil, Paulus Crassus, a scholar of some eminence in those days, and distinguished as the translator of several other medical authors. This edition was reprinted several times and at different places during the following thirty years. The celebrated printer, Morel, first published the original at Paris in 1555. This edition is executed in very elegant characters; but as it contains neither Latin interpretation nor any other subsidiary information, we need scarcely say that it is not well adapted to the taste of the present age. The Greek text of Morel, and the Latin version of Crassus, were inserted, along with a preface, by Albertus Fabricius in his Bibliotheca Græca. These were the only printed editions of the Greek original previous to the Oxford edition now on our table. Four MSS. of the Greek text exist; three in the King's Library at Paris, and one in Venice. Of the Parisian MSS. the first is the only one of any great value, and is the one from which Morel is sup-posed to have printed his edition. The Venetian MS. is of a decidedly superior character, and has therefore been chosen, with much judgment, for the basis of the present edition by Dr. Greenhill; but he has taken great pains further to improve the text, by collating it with the other MSS. and previous editions, and also by comparing the text with that of Galen *De usu Partium*, from which a great portion of the work in question is taken; and further, where all manuscript authority failed to ensure a sound text, Dr. Greenhill has in various instances attempted to improve it by his own conjectural emendations and those of two literary friends, whose assistance he gratefully acknowledges, (Ed. Mon. p. vi.) Moreover, he has given the prefaces of Crassus and Fabricius to their editions, and that of Andreas Mustoxydes and Demetrius Schinas, two modern Greeks, who published fragments of the author at Venice in 1817. The text is throughout illustrated by marginal references descriptive of the matters treated of; and in these the editor, by adopting the modern terminology, has thereby contributed an essential service to the student, who can thus have no difficulty in discovering the anatomical parts to which the descriptions are meant to apply. But by far the most laborious and difficult part of the editor's task must have been the compilation of the *Adnotationes*, which contain a rich mine of critical and scientific in-formation, and therefore cannot fail of being eagerly explored by those

* We hope the SYDENHAM SOCIETY just founded in London under the most favorable auspices, the main object of which is the republication of the ancient medical classics and the select works of the older moderns, will tend to do away this opprobrium of our age.

who are minutely acquainted with and take an interest in the ancient
literature of our profession. To a sufficiency of verbal criticism are added
brief observations on the anatomical and physiological subjects treated of
by the author. But however much we may admire the industry and abi-
lity displayed by Dr. Greenhill in this part, we must decline attempting
to give our readers an analysis of its contents, which do not well ad-
mit of being presented in a condensed form, and are not well adapted to
quotation in such a work as this. Our general opinion of the edition we
may give in a few words: that taking into account the pains bestowed
upon the accuracy of the text, with the elegance of the typography, and
the value of the annotations, we look upon this as being decidedly the
best edition of an ancient medical author with which we are acquainted.

We shall now proceed to give our readers some account of THEOPHILUS
and the matters treated of in his work. Regarding the author himself
little or nothing can be ascertained. It is not even agreed to which cen-
tury he ought to be referred; only this far is discovered from the lan-
guage of his work, which contains several barbarous words not used by
the writers of the earlier centuries of the Christian era, that he cannot be
supposed to have flourished before the seventh century. His quotations
from the Septuagint and New Testament, together with the peculiar style
in which he mentions a Supreme Being, (B. i. § ii.) leave no doubt that
he must also have been a zealous Christian. There are also such traces
of medical knowledge in this work, and still more in his Commentaries
on Hippocrates, published a few years ago by Dietz, (Koningsburg,
1834,) that we need have little hesitation in setting him down for a prac-
tising physician.

The work now under consideration, entitled "On the Construction of
the Human Body," in Five Books, is little else than an abridgment of
Galen's celebrated treatise, "On the Uses of the Parts," in Seventeen
Books. The object of it is to show forth the wisdom of God in the for-
mation of the human body. In a word, what a considerable portion of
Dr. Paley's work on Natural Theology is to the religious reader of the
present day, such must Galen's great work, or the elegant abridgment by
Theophilus, have been to those of former times. And indeed the original
work of Galen need not fear a comparison with the modern; whether we
regard the elegance of its style, the acquaintance with minute anatomy
which it displays, or the profound system of rational theology which it
inculcates.

Throughout this treatise Galen, in imitation of the great peripatetic
philosopher in his work "On the Members of Animals," has advocated
the doctrine of *final causes*, contending that *ends* procure *means*, instead
of holding with the Epicureans and their modern copyists of the French
school, that means led to ends. "It is not," says Galen, "because man
has hands that he is the noblest of animals, but because he is the noblest
of animals therefore he has got hands. For it was not hands which taught
man the arts but reason; hands being the instrument, as the harp is of
the musician, and the tongs of the smith (*De U. P.* i. 3.)"* And in the
following passage, which we could have wished to have found in Theo-

* Sir Charles Bell coincides with Galen in this view of the subject. (Bridgewater Trea-
tise, Chap. x.)

philus, Galen thus unfolds his views with regard to an immaterial princi-
ple in animals :

"The use of all *the members* is for the sake of the soul ; for the body is its in-
strument, and on this account the members of animals differ much from one
another, since it is so with their souls. For some of them are courageous and
some timid ; some are savage and some tame, some are, as it were, political
and mechanical ; and some, as it were, solitary. The body then is suited
to all the affections and powers of the soul ; to the horse it is equipped with
strong hoofs and a mane, for he is a swift, a proud and not a spiritless animal.
To the lion, as he is passionate and strong, it is strengthened with tusks and
claws ; and thus to the bull and the boar, to the one horns and to the other pro-
minent tusks are the natural arms ; but to the stag and the hare as being timid
animals, the body is entirely naked and unarmed. For, no doubt, swiftness
suited the timid and arms the strong. Nature then has furnished no timid crea-
ture with arms nor has left any bold one naked. But to man, as being a wise
animal, and the only divine one upon the earth, instead of all other defensive
arms nature has furnished HANDS, an instrument necessary for all the arts,
both of peace and of war." (*De U. P.* i. 12.)

From this extract it will be seen that in ancient physiology mind or soul
was a term of wide signification, and that to its operations were assigned
many offices which would be looked upon as purely material according to
the prevailing ideas of the present times. Indeed the ancient physiologists
had more comprehensive conceptions of mind than we have, (whether or
not they were more accurate we shall not venture to affirm,) and recog-
nized traces of its activity in various phenomena which we usually ascribe
to *laws* originally impressed upon matter, and operating in some manner
which we do not pretend to explain. Thus, besides the DIVINE MIND,
which they held to be pure reason unmixed with matter, the Platonic
philosophers recognized mind as the active principle in the human organ-
ism, and not only in man but also in all the inferior animals, from " the
half-reasoning elephant," down to corals, sponges, and other zoophytes;
nay, in vegetables and all organic bodies they held that there is an innate
principle of motion, an active and immaterial essence, the cause of all in-
ternal changes, to which they gave the name of NATURE.* According
then to this philosophy, nature is mind, diffused through all the works of
creation, performing certain operations, and acting according to certain
determined laws, but without consciousness. Though ever operating with
consummate skill, the wisdom of its operation is not of itself, but derived
from the FIRST CAUSE which created it and infused it into the universe.
It is to be remarked in this place that Galen usually ascribes to nature
those functional operations in the human frame which his Christian epito-
mizer attributes to the immediate agency of the Divinity, and which a
material physiologist would refer to the laws of vitality or of organization.
It is not difficult then to see that by the vegetative life of plants and the
nutritive life of animals the ancient physiologists meant the energy of a
portion of that principle which we are treating of. " The nutritive part
of the soul," says Aristotle, " performs its operations in sleeping, more
than in waking ; for then, more than at other times, are animals nourished
and grow in bulk, as they have no need of sensation for these purposes."
(*De Somno*, c. i.)

* The original source of the philosophical doctrines here expounded may be found in
Aristotle's *Auscultationes Naturales*. See in particular Simplicius's Commentary on the
second book. A brief exposition of it may be found in Nemesius *de Naturâ Hominis*.

Altogether, as we have stated above, the ancient physiologists held that the only active principle in our body is *mind,* and that the corporeal organs and members are the instruments by which it performs its operations. According to this philosophy it was *for* mind that the great ARTIFICER* constructed the fabric of our body, and *by* mind that the body preserves its organization during life. For, as Hippocrates felicitously expressed it in figurative language, the elements of the microcosm, or little world of the human frame, are engaged in a constant warfare with those of the macrocosm, or the great world, and it is mind which enables the body to maintain this struggle. From what has been already said we will be able to comprehend what the ancient philosophers meant when they likened *mind* to *form,* the body being looked upon as owing its configuration entirely to mind. These doctrines, originating in the Platonic and Peripatetic schools of philosophy, were zealously advocated by Galen, and traces of them, modified no doubt by the principles of his religious faith, are to be found in Theophilus.

We stated so fully in our last Number our own opinions respecting vital properties that we need not occupy the time of our readers in pointing out wherein we differ from Galen. Enough has now been said by us to show that Galen and the physiologists of antiquity knew fully as much about the matter as any of our modern advocates of a vital principle. And, by the way, Lord Brougham, who in his recent edition of Paley's Natural Theology, charges his author with overlooking the importance of mind in the microcosm, would have found Galen, in his work " On the Uses of the Parts," fully as *spiritual* as even he could desire.† And with regard to that principle in the universe which the ancient philosophers call nature, we refer such of our readers as wish to prosecute the subject without being subjected to the trouble of studying Aristotle and his Alexandrian Commentaries, to Cudworth's Intellectual System, where they will find the ancient doctrines fully expounded and illustrated. The ancient principle would seem to be identical with what the German metaphysicians call " the unconscious reason of the universe."

Connected with this subject is the ancient classification of the faculties of organized bodies, alluded to very obscurely and indistinctly by Theophilus in a passage (l. 3,) where the text may justly be suspected of being corrupt. The faculties, then, were divided into the natural, the animal, and the vital. Under the first were comprehended all those faculties or energies common to animals and vegetables, which are subservient to generation and nutrition. To the animal were referred those of loco-

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* This term δημιουργὸς is regularly applied by Theophilus to the Divinity. It is not, however, of Christian origin, as we have seen stated, for it occurs also in Galen's work, and in fact it can be traced to the *Timæus* of Plato.

† The learned Dr. Turton, in his work on Natural Theology, comes to the rescue of Paley, and maintains that there is no foundation for the charge which Lord Brougham brings against him. We must say, however, that it strikes us very forcibly that, according to Paley's system, mind does by no means play so important a part in the animal economy as that which is assigned to it by Galen and Lord Brougham, for his lordship, without seeming to be aware of it, is but the reviver of the Galenical doctrine respecting the functions performed by an immaterial principle in the bodies of animals. Lord Brougham is a follower of Plato, and Paley of Anaxagoras, concerning whom Socrates complains in the *Phædo,* that he sets out with assigning mind as the cause of all the phenomena of the universe, but when he comes to particulars he accounts for everything without the agency of mind.

motion and sensation ; and to the vital were referred those by which the higher classes of animals preserve an equability of temperature, namely, those connected with respiration.   The reader who chooses to prosecute the subject further will find it treated of at great length by Galen in several distinct treatises, and more methodically by Haly Abbas, the Arabian. (*Theor.* lib. ii.)

We must also in this place allude to the distinction of the causes of things first introduced into philosophy by Aristotle and noticed prominently by Theophilus in one passage. (Lib. iii. 12.)   We shall give it as it is laid down by Aristotle's paraphrasist, Andronicus Rhodius ; " There are four causes of things, the final, the formal, the material, and the efficient. The efficient is the energy of the artificer ; the material is the wood and stone of which the house consists ; the formal is the form or plan of the house ; and the final is that for which the house was made." (*In Eth. Nie.* i. 85.)   Theophilus thus applies this arrangement to the case of the human voice :

" Since man speaks and talks, and the accomplishment of everything that takes place in man is from causes, and the causes are four-fold, efficient, formal, material, and final : the efficient cause of the human voice may be held to be the brain, moving the chest voluntarily, (the proximate cause of the voice indeed is the brain, for the remote is the soul directing the brain to move the chest : and then, since the efficient cause is taken in a double sense, the proximate and the remote, there may be reckoned in the case of the voice a still more remote cause, that is to say, the cause of all things, and comprehensive wisdom of God which thus formed and fabricated the members of man ;) the material is the air which rushes forth in expiration ; the formal, is the wind-pipe and the coat common to it and fauces ; and the final, the voice itself."

The late Professor Dugald Stewart, speaking of the Aristotelian arrangement of causes, joins his countryman Dr. Reid in holding " that it amounts only to an exposition of the different meanings of an ambiguous word."   Now, without stopping to examine whether or not there be any room for the censure here implied, we shall only remark that we have seldom occasion nowadays to complain of authors who treat of abstract subjects in physiology that they take too much pains to define the terms which they make use of.   Our editorial labours would be much lightened if our present dabblers in abstract questions regarding vitality would follow the example of Aristotle and Galen in setting out with a well-defined terminology.

We shall now proceed more in order, to give our readers a brief abstract of the matters treated of in the five books of Theophilus.

The remainder of the First Book after the first two chapters on preliminary matters, is devoted entirely to the describing of the mechanism and uses of the different parts which compose the *hands* and the *feet.* It forms a very lucid and useful compendium of the first three books of Galen's work " On the Uses of the Parts." This portion of his work has been so often translated and commented upon in modern treatises on Natural Theology, that we cannot but suppose that most of our readers must be more or less acquainted with it ; we do not think it necessary then to give any analysis of it, and indeed it would be no easy matter to do this, seeing it is almost entirely made up of minute descriptions and reflections on mechanical contrivances, so as not readily to admit of abridgment. We might have felt a disposition to compare this treatise of Galen's with

the Bridgewater Treatise of the late Sir Charles Bell, " On the Hand."
But here we should find ourselves at a loss to institute any particular
comparison between two works bearing scarcely any similitude to one
another.   Galen has all along stuck close to his subject, and has done
such ample justice to it as to leave little prospect to a subsequent labourer
in the same field, of being able to produce anything strikingly original,
provided he pursued the same path of inquiry. Indeed it has often struck
us that Sir C. Bell, must have felt strongly this inconvenience attending
his task, and that this is the reason why he indulges in digressions into
all sorts of collateral subjects, some of which bear but very remotely upon
the one which he had undertaken to illustrate. Altogether then we look
upon the English work, although rich in facts deduced from geology and
comparative anatomy, two sciences which can scarcely be said to have
had an existence in the days of Galen, as far inferior in interest to the
other, if viewed as a disquisition on the adaptation of mechanical con-
trivance in the hand, to the purposes for which it was intended.   And
with regard to ability for grappling with abstract questions in philosophy
involved by the subject, there can be no doubt but that Galen was just
as much superior to Sir Charles Bell as he was inferior to him in a minute
acquaintance with general anatomy. And on one point we are sure that
all who are conversant with the works of Galen will bear us out in our
assertion, that no man could have reasoned more correctly from the facts
ascertained in his time, or have drawn conclusions more legitimately than
he does from the premises then set down as established. We wish indeed
we could say that the masters of our profession in the present time were
as well initiated in the science of abstract reasoning, and were as familiar
with the principles of the higher philosophy, as they were in the days of
Galen, seventeen hundred years ago.   But the truth is that with many
advantages over antiquity the present age seems to labour under this
disadvantage, that scientific truth not being based as in former times on
philosophical arrangement, it but too often happens that all our know-
ledge is merely an aggregate of particular facts or ideas, and that the mind,
by increasing its store, does but add to its own perplexity.

The SECOND BOOK of Theophilus, which is an abridgment of the fourth
and fifth of Galen's work, contains a description of the structure and
uses of all the abdominal viscera.   In this region are seated the four
natural or nutritive faculties with which all living organized bodies are
endowed, the Attractive, the Retentive, the Alterative, and the Expulsive.
For a full exposition of the ancient opinions on this head, we would refer
to Galen's work " On the Natural Faculties ;" Marcrobius, *Saturn.* vii.
4; Haly Abbas, *Theor.* iv. Avicenna I. F. I., *doc.* 6, and Actuarius,
Meth. Med. vi. 7.   Instead of indulging in long quotations from these
authors, we shall give an illustration of the ancient doctrine from the
works of a learned modern writer, Fernel, who appears to have been
thoroughly acquainted with the principles of the ancient physiology :

" If we consider any kind of food, such as bread, flesh, fruit, or wine, it will
be seen that it differs much from the nature of our bodies, nor could be con-
verted into its substance or assimilated to it but by undergoing great changes.
Nor can it be all altered by digestion, for however good and suitable the food
may be, it contains one part fit for nourishing the body, and another part unfit

for this purpose. This latter portion must be *expelled* from the body lest it should prove deleterious, wherefore there must be in us some power or faculty for removing this nuisance. The useful part of the aliment which is left, and is fitted for nourishing the body, unless it be brought to all parts of the body cannot nourish them, but as it cannot go to them of its own accord, it must be drawn and *attracted*. When attracted and joined to it, unless it is retained for some time it cannot be concocted, for whatever is dragged hither and thither, does not easily undergo concoction. Wherefore it is necessary that there should be in us some power to *retain* the element." (*De anim. Facult.* c. 4.)

The Arabians, as for example Averrhoes, and their copyist Actuarius, added to the faculties already enumerated, the Discriminative, by which they appear to have meant (to use the language of Dr. Paris,) "*the selecting tact* with which the lacteals are endowed, and which enables them for a considerable time to reject imperfectly formed or vitiated chyle." (On Diet., p. 220.) Theophilus is at great pains to point out the existence of these faculties in the case of the stomach and of the uterus, between which he institutes an ingenious comparison, (c. 5, 6.) If the reader would wish to see the objections which may be stated to the ancient doctrines with regard to the natural faculties he may consult Dumas, (*Principes de Physiol.* t. i, p. 21,) who, like many of his contemporaries and successors however, would appear to have been but very imperfectly versed in ancient physiology.

The ancient physiologists held that the *liver* is the primary organ in the abdominal cavity, all the other viscera situated there being merely subsidiary to it. In short, all the Greek and Arabian physiologists, accounted the liver to be, as Galen expressed it, the primary organ of sanguification, the viscus by which the food is converted into *blood*, that universal pabulum from which all the other parts of the body are constructed. Thus, the stomach was held to be the viscus in which the food is melted down and reduced to a state adapted for absorption, in which condition it is attracted by the liver, and there mainly is converted into blood, to which office the spleen also contributes by absorbing the more recrementitious part for its nourishment; part likewise passing off by the gall-bladder, and another portion by the kidneys. As Nemesius explains it, the spleen draws off the lees of the blood, the gall-bladder the bitter part, and the kidneys the serum. (§ 23.)

Hippocrates, Aristotle, Galen, and in a word all the authorities agree that the *stomach* performs the same office to an animal that the earth does to a vegetable, namely, that it is the store-house from which the organism connected with it draws its nutritious juices. That the stomach is possessed of the faculty of reducing the food to a fluid state they were well aware, but whether the process by which it effects this be analogous to solution or fermentation ($\pi\epsilon\psi\iota\varsigma$), they were not fully agreed, but in general they held that digestion is a combination of both these processes. "Digestion," says Actuarius, "is performed by moderate heat and moisture." (*De Sp. anim.* ii.) Of the existence of a solvent or *menstruum* in the stomach to which Marcrobius (*Saturnal.* vii. 8,) actually gives the name now applied to it, *ventralis humor* or gastric juice, they were well aware, and although they attributed part of the process to concoction, they recognized it as a vital process, the heat in this case being merely the instrument of the principle of life. "Digestion," says Averrhoes, "is performed by concoction, and concoction by heat, not that the prime

mover in the operation is heat, but the nutritive soul." The food being reduced to chyle, all that portion of it which is adapted to the wants of the system was supposed to be absorbed by the *vena portæ*, called by the ancients *vena truncalis*, from its supposed analogy to the trunk of a tree, the mesenteric and gastric veins being its roots, and the hepatic its branches. In these the chyle puts on the appearance of the substance of the liver, that is to say, is converted into blood, which is distributed over the system by the veins and arteries.

The following description of the process by an ancient author, but the last in the list of the ancient physicians, we mean Actuarius, may be interesting to some of our readers :

" The food in the stomach being altered and concocted, when the meseraic veins, which derive their origin from the liver, have, by their vein called ramalis, sucked the stomach and intestines, and have emulged, as it were, the purer part, (namely the food converted into chyle,) drawing it, as it were, through a strainer, they convey it to the concave part of the liver, and deliver it over to its sanguificatory power. Here then if nothing impede it, when it is changed into blood, whatever is subtile and acrid is received by the gall-bladder, which is placed at the convex part of the liver, and attracts the bile; but whatever the blood possesses of a terrene and melancholic humour, is attracted to the spleen by some natural faculty, whereby every part attracts whatever suits its nature. Thirdly, however, the serous humour remains. It is attracted by the kidneys." (*De Urinis.* § 4.)

From what has been stated it will be seen that the ancient physiologists held the spleen to be a portion of the liver, or at least, that both viscera combine together to the performance of one common function. Aristotle's reasoning on this head has always appeared to us singularly ingenious, we would almost say, completely conclusive :

" Of the viscera, some appear to be single or solitary, as the heart and lungs ; some double, as the kidneys ; and some of a doubtful nature. The liver and spleen would seem to be of the doubtful nature, for each of them would seem to be a single viscus, and yet both to be possessed of a similar nature for one common purpose. In fact all the viscera are double, the cause of which is the division of the body into two parts united together for one common end. For it is divided into upper and lower parts ; into anterior and posterior; and into right and left. Therefore the brain of all animals is double, and so is each of the senses. By the same analogy the heart has its cavities ; and in oviparous animals the division of the lungs is so great, that they might seem to be two lungs. The case of the kidneys is quite obvious. But regarding the nature of the liver and spleen, doubts may be entertained. The reason of this would seem to be that in those animals which decidedly have a spleen, it would appear to be a spurious liver; but in those which have it not decidedly but only a very small one, by way of imitation, as it were, the liver evidently appears to be composed of two parts, the larger portion of which is situated in the right, and the smaller in the left side. And in oviparous animals, although less apparently than in viviparous, the liver is clearly divided : as in certain countries hares have two livers, and in like manner certain fishes, such as the cartilaginous. But because the natural position of the liver is on the right side, the nature of the spleen hence becomes apparent; for it is necessary, but not indispensably necessary . . . . . The liver and spleen assist in the concoction of the food." (*De Partibus animalium,* iii., 7.)

Almost all the Greek physiologists, Galen and Theophilus included, adopt the views of Aristotle. Galen calls the spleen an imitation or resemblance of the liver ; and Averrhoes, the Arabian, holds the spleen to be a second liver. (*Colliget* i. 9.) We may remark here that although

modern physiologists are greatly divided in opinion regarding the functional office of the spleen, many of them concur with the ancients in holding that the spleen is a portion of the hepatic system. For instance, Blumenbach says, " since the spleen is the only organ of that description quite destitute of an excretory duct, excepting its veins which run ultimately to the liver, its function is probably subservient to the latter. This opinion has appeared strengthened by the observations that in animals deprived of their spleen, an experiment made from the most remote period, the cystic bile is sometimes found pale and inert." (Physiology, § 26.)

Little need be said respecting the views entertained by the ancients with regard to the other abdominal viscera, seeing they differed but little from those of the moderns. They were aware that the reason why the intestinal canal is so much prolonged and convoluted, is in order that the chyle might lodge in it and be presented to the mouths of the mesaraic vessels, and by them be conveyed to the liver. Erasistratus, Herophilus, and Galen were acquainted with the lacteals. (See Galen *De Admin. anat., num sang. in art. cont.*) Galen describes the *pancreas* (*de ven. et art. dissect.* c. i. and *de U. P.* v. 2;) but Theophilus would seem to be guilty of the mistake of confounding it with the mesentery, pp. 77, 15. (See Dr. Greenhill's note.) The epiploon, says Aristotle, is of a fatty nature, and being warm contributes to digestion. (*De Partibus anim,* iv. 3.)

The kidneys, it was held, possess the faculty of attracting the watery portion of the blood to them. (Aristotle *de part. anim.* iii. 7-8, Avicenna, lib. iii. Fen. 8. t. i.) This they were supposed to do direct, either by their veins or by certain undiscovered pores, the existence of which is not admitted by modern anatomists.

Theophilus concludes the chapter on the organs of nutrition with an elaborate recapitulation of the processes which the food undergoes from its entrance into the mouth, to its complete assimilation to the substance of the body. Simplicius states them more briefly, thus : " it is the teeth which masticate the food, the stomach which digests it, and the liver which converts it into blood." (*Comment. in Aristot. Auscult. Nat.* ii.)

The THIRD BOOK of Theophilus treats of the parts seated within and upon the thorax. It is abridged principally from the sixth and seventh books of Galen's work. Galen and the other physiologists after him, held that the cavity of the thorax is intended solely for the reception of the *heart,* all the other organs situated there being merely assistants which minister to its purposes. The heart, in a word, was accounted the seat of the vital powers, the fountain of life, and the stove from which the innate heat is diffused over the system by the arteries. "The heart," says Aretæus, " is the origin of life and respiration, for it imparts to the lungs the desire of drawing in cool air." (*Morb. Acut.* ii. s.) Averrhoes, the Arabian, compares the heart to a furnace, the animal heat to the flames, and the vital principle to the person who supplies it with fuel. (*In Cant. Avicen.* Tr. ii.) He says in another place, that the heart is the primary organ of the body, and the *ultimum moriens.* (*Collect.* i. 21.) The heart therefore is the distinguishing organ of the higher classes of animals, in the more perfect of them maintaining a high degree of temperature, whereas in the lower the innate heat is languid and inert like

that of plants, and equally diffused over all the body.   (Aristotle *de Part. Animal.* iv. 6.) The earlier physiologists and philosophers differed much in opinion regarding the uses of respiration to the animal frame. Asclepiades, according to Galen, (*de Usu Respirat.*) held that it is for the generation of the soul itself, breath and life being thus held to be identical; for the strengthening of it according to Praxagoras; for the refrigeration of the innate or animal heat, according to Philiston, Diocles, and Aristotle; for its nutrition and refrigeration, according to Hippocrates; for the filling up of the arteries with spirit, according to Erasistratus.   All these opinions are discussed and commented upon by Galen, who comes to the conclusion that the purposes of respiration are two-fold; first, to preserve the animal heat, and second, to evacuate the fuliginous part of the blood. (Ibid.)   He points out the analogy between respiration and combustion, and comes to the conclusion that the processes are of a similar nature; he therefore compares the lungs to a lamp, the blood to the oil, the heart to the wick, and the animal heat to the flame. (Ibid. 3.)* He speculates acutely regarding the cause why air in certain vaults which have been recently plastered with lime, and in apartments containing the fumes of extinguished charcoal, proves suddenly destructive to life, and determines the cause to be that the air in these cases acts upon the lungs in the same manner that the torpedo acts, namely, by superinducing a certain torpor or prostration of the powers.

Galen, and his epitomist, Theophilus, have given, upon the whole, a wonderfully accurate description of the substance, the cavities, and the valves of the heart, and also of the arterial and venous systems. With regard to the substance of the heart, Galen hesitates to admit with Hippocrates that it is muscular, stating, as is really the case, that its fibres differ considerably from those of muscles. (*De Motu Muscul.* § 3.)   Galen everywhere inculcates that the heart is the centre of the arterial system, and that the left side attracts spirits from the lungs and blood from the right ventricle, and sends them mixed together to all parts of the system.   The office of the valves of the heart is to prevent the regurgitation of the blood from the left to the right side of the thorax during the systole. On all occasions he maintains against Erasistratus that the contents of the arteries is blood and not spirits, and as he further was acquainted with the anastomosis of arteries and veins, it must be admitted, (and, in fact, it is admitted by Harvey himself,) that Galen had made a very near approach to the Harveian theory of the circulation.   We are inclined to believe that he held (although we must admit that in no part of his works has he given so clear an exposition of his system as could have been wished,†) that at every systole of the heart and arteries a certain portion

* The readers will at once perceive that this is an anticipation of the theory of respiration lately announced by Liebig.

† The passages in which Galen expounds his views with regard to the functional offices of the heart are so widely scattered over his works that it would cost much time and trouble for us to prove by quotations the correctness of the exposition which we have given of his system. Our readers therefore must be content to take our word for it that our opinions are formed from a careful study of his works. The following passage from the works of Averrhoes will show that the views entertained by the Arabians were scarcely

of their contents is thrown out by the exhalent and secretory vessels, and that at every diastole blood from the liver and air from the lungs rush in to supply the *vacuum*. It thus appears that, like certain physiologists of the present day, he held that the expansion of the ventricle and arteries is the cause of the influx of the blood, instead of maintaining, like Harvey, that the influx of the blood causes the diastole. But the grand point of difference between Galen and Harvey, and upon which the celebrated theory of the latter mainly rests, is the question whether or not at every systole of the left ventricle more blood is thrown out than what is expended on exhalation, secretion, and the nutrition of the body. Upon this point Galen held the negative, Harvey the affirmative.*

On no point of the circulation has there been greater diversity of opinion than with regard to the power which brings the blood to the heart from all parts of the body. Some with Harvey hold that the blood is propelled by a *vis a tergo ;* others contend for a suction power in the right ventricle; whilst others explain the movement upon the principle of atmospheric pressure, and the tension of the fasciæ, muscles, &c. In the remarks of Galen, contained in the following passage, will be found the germs of most modern theories on this head :

"The heart itself having every imaginable power of attraction, receives into its cavities the materials which flow to it, seizing upon and, as it were, *sucking* them in. Whether it be that as the bellows of smiths when expanded suck in the air, so does the heart much more : or whether as the flames of the lamp attract the oil, so neither is the heart destitute of such a power, being the source of innate heat ; or whether as the magnet by some alliance of properties attracts the iron : for what is more nearly allied to it than air for cooling it? or what more necessary than blood for nourishing it ?" (*De U. P.* vi. 15 ; *de Nat. fac.* iii.)

Avicenna expresses himself in similar terms : " the attraction is performed either by some attractive power as the magnet attracts iron ; or by filling a *vacuum* as water is drawn into a syringe ; or by heat as the

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at all different from those we have ascribed to Galen : " Nutriment comes to the heart by the vein which connects it with the liver, the valve which is in that auricle being so constructed that when opened it may furnish an entrance to the blood, and when shut that it may retain it. But the other ear, [right ventricle ?] which, as some suppose, is from the vein that carries blood to the lungs for the sake of nutriment, [for no veins are continuous with the lungs,] has its valve so constructed thut it may furnish outwardly an open passage to the lungs; but the other of these cavities, [left ventricle ?] is furnished with a three-fold valve, [mitral ?] so that when opened blood and spirits may flow inwardly into the arteries, nor can it regurgitate. This is in the left ventricle of the heart, as is the orifice of the great artery. But the other ear, [left auricle,] which is in the other part, is the mouth of the artery, [pulmonary veins ?] which goes to the lungs, by which the ventilation of the blood is performed ; wherefore its valves are so formed as to open outwardly." (*Collectan.* § i. c. 9.)

* In proof of the fact that a considerable contraction of the cavity of the ventricle takes place in its systole, Harvey appeals to observations made on the hearts of snakes dissected alive. (*De motu Cordis,* c. x.) The writer of this paper has repeatedly dissected vipers in order to satisfy himself in regard to the fact assumed by Harvey ; but he must say that even with the assistance of a microscope, neither himself nor certain friends whom he invited to assist him in forming a judgment in the matter, could ever perceive any such contraction of the bulk of the heart in systole as would have led them to suppose that any sensible portion of its contents had been thrown out. The pulsations of the heart were marked indeed by some change of colour and of tension ; but we repeat that we never could detect any appearance of a sensible contraction of the ventricle, or of a current of blood passing along the arterial tube.

oil in the lamp is attracted, although this case may also be referred to the
filling of a *vacuum*." (Lib. i. *Fen*. i. Doc. vi. c. 3.)

The Third Book of Theophilus contains upon the whole a pretty correct
abstract of Galen's doctrines which we have been discussing, and also
treats briefly of the organs of speech, and of lactation. But we must
pass on to the FOURTH BOOK, in which is contained the substance of the
eighth, ninth, tenth, and eleventh Books of Galen, relating to the HEAD.
Theophilus opens the subject thus :

"That there are three primary organs which regulate the animal frame,
namely, the brain, the heart, and the liver, is admitted by all wise physicians ;
and that the brain by the nerves conveys sensation and motion to all the body,
and the heart ventilating the whole body, by the arteries, thereby animates it,
and that the liver by the veins, as by certain canals irrigates the members of the
body and thereby nourishes and enlarges them, is admitted not only by the
skilled physician, but also by the vulgar."

The primary office of the brain, then, was held to be, to impart motion
and sensibility to all parts of the body by the nerves. It would appear
from the Manual of Anatomy, by Rufus Ephesius, that the celebrated
Erasistratus had attempted to classify the nerves into the nerves of sensa-
tion and of motion; but Galen undoubtedly has the merit of having first
established this theory, so that it was admitted by all the subsequent
authorities on medicine both Greek and Arabian, nay even by Galen's
great modern antagonist Vesalius. Galen divided the brain into two
parts, an anterior called the cerebrum, and a posterior called the cere-
bellum ; the former of which, he says, is of a soft nature and gives rise to
the sensatory nerves, and the latter is hard and gives rise to the motory.
Without wishing in the slightest degree to detract from the merit of the
late Sir Charles Bell, and the other physiologists, English, French, and
Italian, who have improved this branch of physiological anatomy, we must
be permitted to say that, although there be a portion of error mixed up
with truth in Galen's theory, it enabled him to classify the nerves of the
face, the neck, the tongue, and of the organs of nutrition and respiration,
with a degree of accuracy and discrimination such as will hardly be cre-
dited by those who think very meanly of the Galenical anatomy, and
would restrict all knowledge of the subject to the present age.

Galen's description of the brain is much the same as that usually adopted
by modern anatomists, until Reil, Malacarne, Tiedemann, and other la-
bourers in the same department, extended our knowledge of its minute
anatomy. Theophilus describes the cerebral vapour contained in the ven-
tricles as being thin, and free from impurities ; but does not seem to have
been aware that it is a fluid in its natural state. He thus describes the
office of the animal spirits :

" Deservedly the brain has received the uppermost region of the body for its
abode, like some master of a house, having as its guardsmen all the senses, the
sight, the hearing, the smell, the taste, and the touch ; which despatching over
the whole body, she confers sensibility upon it, imparting to it sensation and
motion by the animal spirits."

Before concluding this part of our subject we would wish to say a
few words respecting the opinions entertained by the ancients as to the

connexion between the mind, and certain organs of the human frame.
Plato divided the soul of man into three distinct parts, reason, passions,
and desires, (see in particular *De Repub.* lib. iii.)   Viewed as the divi-
sion of a material object this arrangement must appear highly fanciful,
not to say absurd ; but as it is illustrated by the learned Fernel from the
formation of the posterior geometrical figures from the first it appears in
a different light. Thus, if a triangle be properly applied to another triangle
it will form a tetragon, which is not a composite but simple figure ; and if
another triangle be added to it a pentagon is formed, which is simple in
reality but composite in power. (*De Anim. Facult.* c. 18.) Galen, whose
mind was deeply imbued with the principles of the Platonic philosophy,
applies this doctrine to the human body, maintaining that the brain is the
seat of reason, the heart of the passions, and the liver of the desires. (*De
Facult. naturalibus, passim.*) There is scarcely a speculative opinion in
science or philosophy which ever obtained a more general and enduring
acceptance than this doctrine obtained, having been adopted generally
by all the Greek *sçavans* after Galen, by the Arabians, and by the earlier
modern authorities, as for example, Fernel (*de Anim. Facult.* c. 14.) Nay,
very recently the celebrated Bichat espoused this doctrine, though with-
out acknowledging the quarter from whence he derived it.   He argues
that general observation has proved that during intense passions it is the
heart that is primarily affected, producing palpitations, &c., that the
actor in representing such emotions applies his hand to his heart and not
to his head. (*Sur la Vie et la Mort*, p. ii. a. 5, and further p. 227.) In like
manner Dr. Mason Good argues that the vulgar character of the *liver* as
indicative of hatred and revenge is not merely figurative, but has a founda-
tion in nature ; that anger long indulged is known to affect the functions
of the liver, and has often laid the foundation for jaundice ; and that the
seat of anger has in the poetical language of most countries been trans-
ferred to this organ, and that choleric and irascible are convertible terms
in the popular language of our day. (Study of Med. vol. iii. p. 114.)

There occurs in Theophilus (p. 184.) another division of the brain as
regards its connexion with the operations of mind to which we would
wish to direct attention, as bearing a considerable resemblance to that
which is adopted by the more scientific phrenologists of our times.   Ac-
cording to it that department of the mind called the fantasy, namely
the sensorium or receptacle of ideas, is connected with the anterior part
of the brain ; cogitation or the *discursus mentis* with the middle ; and
memory with the posterior.   We shall attempt a translation of this pas-
sage in the work of Theophilus :

"The anterior ventricles of the brain comprehended under the forehead, con-
tain the fantastical part ; for there being three general functions performed
by the vital spirit, namely, fantasy, memory, and the *discursus mentis*, three
distinct places of the brain are allotted to them for their abode, the anterior, the
posterior, and the middle.   The fantasy is seated in the anterior part, the *dis-
cursis mentis* in the middle, and the memory in the posterior. But how and in what
manner Homer says that the ruling part of the soul is in the heart, and also
many other Greeks, nay even the divine gospel itself, ' for why,' says it, ' do
thoughts arise in your hearts ?' (Luke, xxiv. 38,) I cannot tell, for often phy-
sicians inquiring concerning the loss of reason and memory, in order to find out
the part affected, could discover none except the brain.   Wherefore all suitable

applications for the cure, and fomentations, and other remedies, they apply to the head and not to the heart," &c.

Now it is worthy of remark, that no traces of this hypothesis are to be found in the works of Galen. It originated, no doubt, in the eastern schools of philosophy, and accordingly the first indication of it, as far as we know, is to be found in the works of Nemesius, who is said to have been Bishop of Emesa in the fifth century. It is adopted by all the Arabian medical authors. (See in particular Averrhoes, *Colliget.* ii. 20.) We need scarcely stop to point out the resemblance between this division of the brain, and that of the modern phrenologists, who hold that the intellect is connected with the anterior part, the moral feelings with the middle, and the animal appetites with the posterior.

We have already taken up so much space with the analysis of the work before us, that we must be very brief in noticing the other subjects handled by Theophilus. He treats of the nose, the eye, its appendages, the tongue, the jaws, the teeth, and the ears. We would beg to direct the attention of our readers more particularly to Galen's admirable disquisition on the eye. (*De U. P.* x.) It is singular that he should have thought the crystalline lens the seat of vision, notwithstanding that he appears to have been familiar with the operation of couching the cataract. (*Ars Medica*, and *de U. P.* x. 1.) The ancients in general looked upon the cataract as being a film anterior to the lens; some of them, however, were aware that the disease is sometimes seated in the lens itself. (See notes to the English translation of Paulus Ægineta, by Mr. Adams, p. 393.)

The contents of the Fifth and last Book of Theophilus are mostly taken from the twelfth, thirteenth, fourteenth, fifteenth, and sixteenth books of Galen's work, and from Hippocrates *De geniturâ* and *De naturâ pueri.* He treats first of the spine, beginning with the spinal marrow, which, according to Galen, springs from the brain as a trunk, and is divided into nerves, as it were into branches. He then touches briefly on the vertebræ and the construction of the various joints of the body. From the seventeenth book to the end he dwells upon the subject of generation, anatomically and physiologically, and handles it in the fullest manner. Though Galen and Theophilus are sometimes guilty of mistakes in their anatomical descriptions, from applying to the human body what is applicable only to the inferior animals, the general idea which they give of the relation between the sexes is correct, and corresponds with the comparison made by many modern authors, namely, that all the parts in the two sexes are analogous, with this difference, that in the male they are placed without, whereas in the female they are situated within. Most of the ancient anatomists fall into the mistake of describing the human uterus as consisting of two distinct cavities, a right and a left. But, as Dr. Kidd points out, there is a passage in the works of Galen from which we must infer that he had more correct ideas on this head.[*] The same cannot be said of Theophilus, who, in his Commentary on Hippocrates, dis-

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[*] Vol. v. p. 789, ed. Kuhn. See Kidd's Analysis of Galen's works in the Transactions of Provincial Association.

tinctly says that the womb consists of two cavities, "separated by a certain membrane." (See Greenhill's *Adnotationes*, p. 330.)*

At c. 33, Theophilus gives a brief description of the development of the fœtus *in utero;* it is, however, but a meager abstract of Galen's ingenious tract "on the formation of the fœtus." Galen there states that it had been made a question what part of the body is first formed, some contending for the priority of the heart and others for the liver. Many of the Stoic and Peripatetic philosophers were of the former opinion, principally, as he says, on theoretical grounds. Galen maintains, from observation and dissection, that the liver has an existence antecedent to the heart, and yet he does not hold that even it is the part of the fœtus which is first organized. First of all, he says, are formed the vessels that connect the fœtus with the uterus, being analogous to the roots of trees ; these unite together and form the umbilical vein, which is analogous to the trunk, and its ramifications to the branches. He would appear to refer the first organization of the fœtus to what Blumenbach calls a "nisus formativus," which he calls a power in the semen. He argues ingeniously that it is not correct that the parts first formed produce those which are next in the order of formation ; but that nature first forms one part of the fœtus and then another, and does not as it were set the work a going and then leave the parts just made to complete the work. Upon the whole then he does not approve of the views of those physiologists who hold that the liver forms the heart and the heart the brain, but maintains that these three primary organs have a mutual dependence upon one another, and that in like manner the secondary organs depend upon the primary. He concludes with confessing the difficulty he felt in determining what the substance of the soul is which presides over the formation and preservation of our bodies, in which as all recognize the traces of intense skill, some referred them immediately to the work of an intelligent principle, whilst others hold that the principle which directs the process is itself devoid of understanding.

But it is now time for us to draw to a conclusion. We trust that the exposition we have given of the doctrines entertained in former times by our profession on so many important subjects, will prove not altogether devoid of interest, even to such of our readers as may think that we have paid greater deference to the opinions of the ancients than they actually merit. It surely can neither be uninteresting nor unprofitable to compare the opinions entertained in the present advanced state of physiological science, with those which occurred to the minds of the great fathers of medicine. A perusal of old doctrines, to use the words of a learned author, may afford amusement, if it be true "that what from its antiquity is but little known, has from that very circumstance the recommendation of novelty." (Harris, *Philosophical Arrangements*, p. 111.)

* Ib. On the other hand the description of the uterus given by Moschion is very correct.

Art. XIII.

An Inquiry into the Nature and Causes of Epilepsy; with the Function
    of the Spleen, and the use of the Thyroid Body, &c. &c.   By John
    Jackson, Member of the Royal College of Surgeons.—*London*, 1842.
    8vo, pp. 107.

A maiden essay to explain several difficulties by which the wisest phy-
siologists of all ages have confessed themselves foiled, indicates a man
who has no ordinary confidence in his own power; and that our author
is not, in self-distrust, one of the crowd, is well proved by the spirit in
which he writes. It is a style not of question or suggestion, but of down-
right dogmatic assertion, in which he lays down the following doctrines:—
Ligature of the superior cava produces cerebral congestion and insensi-
bility; ligature of the same vein, below the entrance of the vena azygos,
produces cerebro-spinal congestion, and thence both insensibility and
convulsions. Insensibility and convulsions in general, and epilepsy in
particular, are therefore due to cerebro-spinal congestion. This conges-
tion can be produced only by obstruction in the lower part of the vena
cava superior; and such an obstruction can be due to nothing but an
excessive force of the current through the inferior cava, making a rush of
blood into the right auricle; and this rush is due to an excessive con-
traction of the spleen forcing the blood, in a sort of torrent, through the
venous system of the liver.

The foundation of the greater part of the book, then, rests on the as-
sertion that it is the office of the spleen, as an assistant organ of the cir-
culation, to force blood through the liver. " It is the spleen which pro-
pels the portal blood through the portal trunk, branches, plexuses, and
hepatic veins, to the inferior cava and auricle, and regulates the quantity
and force with which it is propelled." (p. 27.)

It will probably content our readers if we let them know the style and
value of the work, by examining each of the grounds on which this new
account of the office of the spleen is founded.

It is said,—" The *vis a tergo* of the heart's action is not adequate to
propel the blood through the venous and two capillary systems, and an
additional power is necessarily required" to propel it through the liver.
Now no proof of this is adduced, but it *has* been proved that, after death,
a syringe worked with no greater force than the hæmadynamometer in-
dicates as the force of the left ventricle, *is* capable of propelling fluid
through the liver, and that without the sucking influence of inspiration.
The general and fundamental assertion is therefore at once, and in
general, disproved.

The grounds in particular on which it is made, are that there are pe-
culiar difficulties in the passage of the blood through the abdominal
vessels. Let us examine them. First, these vessels are said to be very
tortuous. We were not aware of the fact. With the exception of the
splenic artery and a small part of the coronaria ventriculi, the intra-
abdominal arteries and veins run as straight as those of most parts of the
body. Secondly, these vessels anastomose very often. But, the meeting
of currents presents no hinderance to the circulation when there are suf-
ficient side-channels for the blood to pass through; and of these there

are many in all this part of the vascular system.   But thirdly, says Mr. Jackson, the ascent of the blood through the roots of the portal vein is not aided by muscular contraction, nor is its descent prevented by valves.   True: but there is here, as we shall presently show, a grievous defect in his physiology.

He institutes a comparison between the arteries of the lower extremities and those of the digestive organs, and he says that the contrast between them is very strong, especially in regard to the absence of anastomoses and of tortuosity in the former. The tortuosity, as we have said, is equally slight in both; and, for the anastomosis, there is no contrast, but a similarity.   Mr. Jackson surely forgot the existence of plantar and dorsal arches, of anastomosing arteries, the junctions between the anterior fibular and anterior tibial, and between all the arteries of the leg around the ancle-joint.   In proportion to the number and size of its arteries, there are unquestionably as many anastomoses in the leg as in the intestines or mesentery.   But there is a contrast, it is maintained, in the matters of muscular pressure and of valves ; and this is supposed to be the more important, because the blood has to move upwards.

This terrible influence of gravity is one of the most important items in Mr. Jackson's assertions : but he both misunderstands and misuses the facts of the case.   He loses sight of the fact, that there is as high a column of blood in the arteries as in the veins below the heart, and that, therefore, the blood in both those sets of vessels is supported at an exact equilibrium, so that, when the two columns are each and together continuous, and both sets of vessels are healthy, the blood can be moved, where there are no valves, with equal facility in either direction.   He deems the occurrence of varicose veins of the legs important, as indicating that although the same condition does not occur within the abdomen, yet there must be great hinderance to the blood.   An ordinary man would have supposed, in the absence of a similar consequence, that a similar precedent condition does not exist ; but our author can overlook the facts that the column of blood is more than twice as high, and therefore the pressure more than twice as great, upon the veins of the leg, as upon those of the digestive canal; and that varicose veins are the cause, not the effect, of difficulty in the circulation, being produced solely by the statical pressure of the blood, without any reference to its motion.

As to the valves, their use is also entirely mistaken.   They have, it is well known, no relation to the gravitation of the blood.   The venous column, as we have said, is supported by the arterial; and even when the blood is at rest, and the body erect, the valves cannot be forced down so long as the columns in the veins and arteries are continuous, for the pressure must be the same on both sides of them. Besides, suppose a pair of valves *could* be forced down by the weight of the blood above them : the case of the blood below them would be as bad as before ; for what matters it whether its onward course be prevented by a superincumbent column of blood, or by a pair of valves closed over it? for, unless the valves be completely closed, the pressure from above is not diminished, and when once closed they cannot be opened unless the blood below them can force on that which is above them. The valves, then, we repeat, have nothing to do with the gravitation of the blood : they are found in veins in which the blood moves downwards, as well as in those in which

it moves upwards; in short, in all the parts in which the veins are subject to muscular or any other habitual local external pressure, and in all of these their purpose is, to make as much as possible of that pressure efficient to the propulsion of the blood towards the heart, in a manner which Mr. Jackson might have learnt from any good system of physiology. Now, the veins of the digestive organs are not subject to this kind of pressure: valves, therefore, in them would be useless, and they do not exist. According to our author's view, their absence would be a great omission on the part of the Creator.

From the midst of all this error, Mr. Jackson has omitted three facts, which, though they are directly opposed to his views, are more important and exact than any he has inserted: viz., that in the splenic vein itself, on which the spleen must act most directly, the blood moves horizontally, and therefore *not* against gravitation; that through the liver, in which alone, after the portal trunk, the action of the spleen is exerted, the ascent in man is not more than an inch or two; and that, in this respect, the relation between man and quadrupeds is the very reverse of that on which he founds one of his chief arguments for his notion of the spleen's office, for the blood has to make a greater ascent in the hepatic veins of the latter than in those of the former.

We look in vain for one fact, or one correct argument, to prove that there is a peculiar difficulty in the passage of the blood through the digestive organs, or a necessity for any extra-propelling force; and we think we shall long look, with as little success, for any author making more mistakes in his first thirty pages than Mr. Jackson has made. But we come now to a more extraordinary assertion than any yet reviewed:

"The spleen, by its structure, properties, and position, and by its connexion with the trunk of the portal system by the splenic vein, is eminently adapted for the function of propelling the blood through the portal trunk, branches, plexuses, and hepatic veins." (p. 28.)

The sum of the facts of structure, &c., by which the spleen is thus eminently adapted to be a second heart, is that its fibrous coat and septa are elastic, and that there is some suspicion (and only a suspicion,) that they have a peculiar vital contractility, so that independently of its elasticity, the spleen may be able occasionally to discharge some of its blood. But Mr. Jackson can afford to forego this little, and, as we admit, very unimportant evidence for his notions: for his *proof* that the spleen is a heart is established by its analogy to—the placenta!

The points of analogy are :—1st. That "the circumference of both is more or less lobulated or fissured;" on which ground the brain, the lungs, the fœtal kidneys, and the pancreas, must be closely analogous to the placenta, for they are all more lobulated than the spleen. 2d. That "the spleen is enveloped by an elastic capsule,—the placenta is inclosed between two layers of an elastic membrane, the decidua;"—between which there is about as much analogy as between the dura mater and the chorion, or between caoutchouc and tissue-paper. 3d. That "both organs present a spongy and reticulated texture, consisting almost wholly of vessels, and chiefly of veins;" a good example of the judiciously indefinite style in descriptions which are intended to establish an analogy between things widely different. 4th. That the nerves of both are small; the fact being that the nerves of the spleen, when compared with those of

the other viscera of organic life, are *not* small, but rather large, and that those of the placenta are *so* small that they have never yet been seen by any credible anatomist. Lastly, both organs are possessed of a peculiarly contractile power. Reserving this last, which is perhaps the most absurd of all, did you ever, good reader, meet with such a set of analogies in your life?

With respect to this contractile power of the placenta, from which a similar power is, by analogy, deduced for the spleen, Mr. Jackson's argument is, as usual, an assertion. He says, naïvely enough,—

"Whether or not it be conceded that the spleen is the organ which subsequently to birth propels the blood through the portal plexuses and the hepatic veins to the inferior cava and right auricle......I presume there are none who will be disposed to deny that the placenta performs that function in the fœtus." (p. 34.)

Disposed to deny it? Why! is there another man living who would assert such a thing? Need we say that there is not even the suspicion of a fact in favour of such a notion? After this, and when we assure them that all the rest of the book is of the same kind as that which we have quoted, and some of it even more absurd, our readers will hardly expect us to go on disproving what Mr. Jackson has written. One passage, however, is too *good* to be omitted.

"Inspiration," he says, "is commonly supposed to have the effect of facilitating ingress into the auricle by the inferior as well as by the superior cava. It appears, however, not very comprehensible, indeed to carry with it a contradiction, that inspiration should facilitate the ingress of blood by *both* venæ cavæ; that the same act should increase the impetus of two conflicting currents; that it should cause *descent* of the one and *ascent* of the other." (p. 62.) . . . . Perhaps it is simply by *gravitation* that *inspiration* increases the force of ingress into the auricle by the superior cava." (p. 87.)

Oh! that some good friend had either prevailed on the author not to write, or else had taught him that the pressure of the atmosphere, like that of all fluids, is in all directions—equal.

We regret to be obliged to expose so many errors in a few pages, but we hope, and from his style we are led to believe, that Mr. Jackson will be more instructed than vexed by our remarks. On the next occasion he had better choose an easier subject; and we will suggest to him this problem (founded on his errors), of which he may apply the solution to other questions in physiology:—If the blood *be* forced rapidly through the splenic vein, it must be materially retarded by each of the slowly-moving currents which join it from the inferior, and superior, mesenteric and other veins; and to each of these it has to impart some of its velocity, till they both move together at the same rate. How much of its extra force, then, will remain at the vena portæ? And, in general, what is the influence of slow currents of venous blood passing at various angles into those which are moving more rapidly? a condition which probably frequently exists, though not at the splenic vein. Or this:—When the spleen contracts (if it have a power of contracting in mass), what would be the difference (if any) between the retardation of the blood in the splenic artery, and its acceleration in the splenic vein?

Art. XIV.

Commentaries on some Doctrines of a dangerous tendency in Medicine, and on the general principles of safe Practice. By Sir Alexander Crichton, m.d. f.r.s. l.s. & g.s., &c. &c.— *London,* 1842.   8vo, pp. 283.

These Commentaries constitute a review of medical opinions and practices prevailing during a long period of time; and considering that the author states in his preface that he has attained the age of seventy-nine, and when it appears that his period of professional observation exceeds considerably half a century, it must be admitted that there are strong arguments for his competence to the office which he has assumed. But when we discover, moreover, which the perusal of even a few pages enables us to do, that age, whilst it has abated nothing of the vigour of his intellect, has added prudence and sobriety to its exercise, and when it is likewise manifest that he has been a reader, observer, and thinker, in various climates, and under circumstances the most favorable to such pursuits, our expectations of pleasure and profit from the office of reviewing his work become very much exalted.   The age which Sir Alexander Crichton has attained, and the eminence on which he stands, place him beyond the hopes and fears of professional life, and are a security for his addressing the public solely on the legitimate ground of his having something to say to it which he considers deserving of its attention. We cannot contemplate without respect a man, arrived at an age when repose is to most so seductive—and all would be excused for yielding to the seduction—who musters his strength to impart to others those truths which he has employed so many years in collecting. He is not satisfied, like the contemplative philosopher in Lucretius, to exult in his own exemption from error, whilst he sees others darkly straying from the truth; but he extends to them the torch which he thinks likely to guide them in its paths.

These prepossessions, however, ought not to influence our critical judgment, nor shall they do so. Sir Alexander's work must be appreciated at its intrinsic value, and not for the venerable age, or high respectability of the party whence it has emanated; and we shall now proceed to review its contents, and to comment upon them, bearing ever in mind the objects of the author, who does not profess to deal in novel views, but, from contemporary opinions and practices, to select and recommend the most worthy.

The functions of the heart and arteries. The first commentary is on a physiological question,—the functions of the heart and arteries.   The doctrines compared are, that originally promulgated by Haller, and subsequently adopted by various eminent physiologists, according to which the blood, after its expulsion from the heart, is propelled in the arteries, and especially in the capillaries, by a regular succession of muscular contractions and relaxations of these vessels, similar to the systole and diastole of the heart, and that published by Dr. Thomas Young, in the Philosophical Transactions for 1809, denying such action to arteries, though admitting the existence of a muscular coat in their structure, the effect of which he considers to be merely an increase of the elasticity of

the artery. The former part of Sir Alexander's commentary is to confirm
the view taken by Dr. Young, though with some modifications, the nature
of which is not always very clearly explained. He is of opinion that
every phenomenon of the circulation of the blood in its usual or normal
course, which depends on arterial pressure, may, indeed, be explained by
the elasticity of the arteries. But, although for the wisest ends, these
vessels are very insensible to nervous excitement and impressions, and
consequently are not exposed, like some other organs, to be agitated and
disturbed by the passions, yet, like most of the living structures of our
complicated frame, they may, under certain circumstances, be influenced
by affections of the brain. In no other way, he remarks, can we account
for either the turgescence or collapse of portions of the blood-vessels
from mental causes, or from certain stimulants and sedatives, the first
action of which is on the stomach.

Those well-known partial deviations from the ordinary tenor of the
circulation, from mental or other causes acting on the nervous system,
certainly appear utterly irreconcileable with the assumption that the sole
moving powers of the blood are the central organ, and mere elasticity of
the arteries. This elasticity, however, Sir Alexander tells us (p. 31) is
of a vital nature, and may be increased or diminished by the exaltation
or diminution of cerebral influence. We have certainly always re-
garded elasticity as a quality depending for its existence and degree on
the nature or texture of the substance endowed with it ; and we cannot
help regarding the application of the term to a quality admitting of sud-
den variations from mere emotion, or causes acting sympathetically,
which cannot have any influence on the texture of arteries, as calculated
to introduce confusion into our language and reasonings on the subject
of the circulation.

Not doubting that the weaker side of the controversy is that embraced
by our author, and believing that there is no little confusion, at least, in
his expression of the modifications he would introduce into the doctrine
which he professes to support, we question whether his error does not
consist rather in phraseology than in fact. His own modifications of the
doctrine, as we understand them, would convert the property which he
terms elasticity into a capacity of action having a much closer relation
to vital dilatation and contraction than to the merely physical quality
ordinarily designated by this term. Our limits will not allow us to enter
upon the consideration of this subject at present ; but we would recom-
mend to the notice of Sir Alexander Crichton, and our readers, the ex-
periments and observations in reference to this point by Sir Charles Bell,
in the volume of Essays published just before the author's lamented death.
Although containing less novelty, perhaps, than their author imagined,
they afford a completer and more intelligible exposition of the questions
at issue than is to be found in any recent work.

Our author has two sections on *Exercise* and *Inaction*, to his instruc-
tions on which subjects his views on the circulation are preliminary. We
think his practical precepts valuable, but their truth so entirely indepen-
dent of all theories of the circulation, that we cannot see the necessity for
the hypothetical disquisition which serves as their preface. He is friendly
to regular and opposed to violent exercise, especially after a full meal,—
as who is not? Observation, he tells us, among agricultural labourers

and the poorer classes generally, have shown him that aneurism of the aorta, and dilatation of the left ventricle of the heart, are frequent diseases of this class ; and he thinks great muscular efforts, especially after taking food, a very frequent cause of them, the muscular exertions throwing more blood on the central organ of circulation than it can dispose of. Of the frequency of the diseases in question, especially of the heart-affection, no one can feel a doubt whose opportunities of observation have been considerable, or who is acquainted with Dr. Clendinning's statistical details on the subject; and we think there is much reason for ascribing their origin to violent exertion. We are the more inclined to the latter opinion from having observed the great frequency of diseases of the heart among sailors, a class in which violent exertion is of constant occurrence. In the following passage, Sir Alexander indicates, and we think with truth, an error in the management of exercise by a different class :

"A common error is frequently committed, from ignorance or from false notions, by those who have a full command of their time and pursuits. Many unemployed men of wealth imagine that if they dedicate several hours, consecutively, in the early part of the day, to a fox-chase, to a stag-hunt, to a game of cricket of many hours' duration, or a tennis, or in fencing or any other gymnastic exercise, they have done that which contributes much to health, at least for one day ; judging perhaps by the keen appetite which so great a waste of solids and fluids occasions. The consequence is, that the remainder of the twenty-four hours is apt to be spent in nearly complete inaction, and hurtful indulgence. Many strong and healthy young people may unquestionably derive benefit from such exercises in the open air, but that many others are injured by it is certain, for the reasons assigned, as well as for others I am about to mention." (Crichton, p. 35.)

Our author has a passage on the effects of severe muscular exertion in young and delicate persons whose thoracic organs are imperfectly developed in proportion to the aorta.   To the affection produced by this cause in persons so constructed, he gives the name of asthenia of the heart, and he thus describes it :

"Its most characteristic symptoms are pains in some parts of the spinal column, a sense of great languor and fatigue, and more or less muscular weakness in the lower extremities, the pulse being generally quicker and smaller than usual, together with some disturbance of the digestive organs." (p. 38.)

This is a condition abundantly familiar to us and most medical men ; but we never thought of ascribing it to asthenia of the heart exclusively. The whole system is in a state of asthenia, and we would say, that if the defect of energy were more manifest in one part of the system than another, it was in the nervous centres. This preponderance is indicated by incapacity of sustained attention and any considerable mental exertion, by the feebleness of the lower extremities to an extent to cause the patient to trip in walking, and we would add, too, by the pain in the course of the spine, so properly enrolled among the characteristic symptoms by Sir Alexander Crichton. He questions, too, its origin from excessive exertion, having generally found it to occur in young persons leading sedentery lives, in students for instance, and young persons engaged in counting-houses, and lawyers' offices. Though differing from our author, in some degree as to the nature, and certainly as to the cause of the disease, we concur in his method of treatment, which he tells us should consist in corporeal and mental rest, a nutritious diet of easy digestion,

given to the extent and as often as the patient can bear it, small doses of quinine and sulphuric acid or vinum ferri, and an opiate at bed-time, should sleep be wanting. We concur, as we have said in all this with the exception of the corporeal rest, having found a gradual progression of exercise, according to the following scale, generally to promote recovery,—gestation in an open carriage, gentle rides on horseback, walking.

Typhus fever. We now reach the second and most important commentary, that on the doctrines and treatment of continued fevers of a typhoid character. Sir Alexander's extensive opportunities of observing disease, and acquaintance with physicians and their mode of thinking and acting in various countries, render this section of his work at once instructive and amusing. It appears that he proceeded to Russia in 1804, when Brunonianism, under the name of the " *Erregungstheorie*" (excitement-theory) and in its worst form had taken possession of the minds of Germany. To these dreamers succeeded in 1810, a race of sophists, of a still more intractable character, *the philosophising physicians of nature*(die natur-philosophischen Aerzte) issued from the schools of Schelling, Kilian, and Oken. It was the duty of our author to superintend and direct the practice in the various medical establishments of the Russian empire, and the majority of his subordinates were Germans deeply imbued with one or other of these pestilent fancies. With the disciples of Brown he could reason ; but not so with his philosophising coadjutors, for he could understand neither their language nor their definitions. This will be deemed no serious imputation on the perspicacity of the worthy knight, when it is found that he was treated to such *lucid* matters as the following : " Light is the separation of that which is absolute ; it is the primitive action of pure activity ; it is the animating soul of ether by which it is placed in polar tension." This is the definition of light by Schelling. The following definitions of disease are from the same high authority and his disciples : " Disease is a change of the dimensions of human organism ;" or, " it is a disproportion between organic activity and organic structure;" or again, " it is the opposition of the special or specific quality of *organismus* united to the *idea* of life ;" or finally, " it is the reigning difference of individuality and universality." One of these worthies seems to have understood his real vocation when he replied to Sir Alexander, who, it would seem, was labouring (of course in vain) to inspire him with a little common sense : " Sir, we are taught to think deeply, and to write on the philosophy of nature and of medicine, but not to practice it. Procure a professor's chair for me ; that is my vocation." (p. 63.)

We think it a matter of regret that the successors of these *philosophisers* have not been equally cognizant with the would-be professor, of their real calling. To dream, and publish dreams, are occupations often amusing and generally innocuous ; but dreams reduced to action in the form of homœopathy and hydropathy, involve the health and lives of thousands.

We do not deem it necessary to follow our author through his criticism of Rasori's *diathesis di stimulo* and *di contra-stimulo*, and the extravagant practice which resulted from them. We should quote largely from this section of the work which treats of these matters, did we think there

was a possibility in the present era of any patient in any country losing
in nine days, fifteen pounds of blood, and swallowing 220 grains of digi-
tilis, as did one unhappy victim of Rasori's doctrine. But as we have
evidence in the recent history of hydropathy* that the reign of error
and dangerous error is not yet at an end, we would recommend, if in
any corner of the Old or New World, doctrines so absurd, leading to
practices so murderous, as those of Rasori still linger, that *there* the
commentary included between the 63d and 77th page of Sir Alexander's
work should have careful perusal and consideration.

A very important portion of this commentary is that in which what
may be called the French doctrine of fever, and the practices founded
by some upon it, is examined. The opinion that what were by Pinel
and physicians of this country considered as essential fevers, are de-
pendent for their existence on a lesion, generally of an inflammatory
nature, in the alimentary canal, is still so prevalent in a modified form,
at least in France, that we cannot be in error in considering it the
reigning doctrine there, especially when we find the same doctrine en-
tertained, with some slight modifications, by Louis and Cruveilhier.
Sir Alexander bestows on these distinguished parties, and especially on
Andral, much praise for their pathological discoveries, but expresses his
regret that such discoveries should have tended to injure rather than
improve practical medicine ; but this must always occur, he remarks,
when morbid appearances are incorrectly interpreted.

Not only, however, does he differ from these French authorities as to
their practical inferences, but questions the universality at least of the
facts whence they are deduced, quoting Dr. Little of Belfast, to show
that of sixty fatal cases of fever he did not find one with signs of *acute*
inflammation of the mucous membrane of the stomach and intestines.
The question, however, does not regard the existence of acute inflam-
mation of the stomach and intestines excepting perhaps with Broussais ;
with the other writers it relates to the well-known affections of the plates
of Peyer, and the glands of Brunner, constituting conjointly what
Bretonneau has called *dothinenteritis*, and there can be now no doubt
that this, though less frequently, we believe, in this country than some
others, is a very general accompaniment indeed of typhus.

But however general it may be, even allowing that it should be found,
as estimated by Andral, in ninety-eight of 100 cases of typhus, and we
are convinced that in the typhus of Britain it would not be found in so
high a ratio, though we should deem it an important element, we yet
could not consider it the essential constituent, or (to use a phrase now
nearly and deservedly obsolete,) the proximate cause of the disease,

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* In our remarks on hydropathy we would wish it to be distinctly understood that we
have no intention of questioning the benefit conferred in certain chronic disorders, the
fruit of sloth and indulgence, by the cold water process of Vincent Priessnitz and the
hygiènic discipline with which it is associated. But with whatever discretion the strong
sense of the author of this system may lead him to restrict it to certain chronic derange-
ments of function to which alone it can be applicable, we have abundant evidence that
his followers in this country, not much more erudite and certainly less wise than their
master, lavish it indiscriminately on acute and chronic—sthenic and asthenic disease, with
what result coroners' inquests will ere long decide. Would any medical man choose
to have inflammation of the lungs or peritoneum in his own person treated exclusively by
wet cloths ove the chest or abdomen ?

since it is not, even on the showing of Andral and Bretonneau, its uni-
versal accompaniment. That it is an important element is manifest from
one of Andral's cases, (and many similar examples might be adduced,)
in which *dothinenteritis* proceeded so far that the intestine was perforated
and death ensued ; that it is one of frequent occurrence is admitted on
all hands ; but how it should influence our treatment of the disease has
not yet been shown. M. Andral, it would seem, was led by his know-
ledge of the pathological condition to bleed rather largely in some cases
of fever. In one of these cases three bleedings of twelve ounces each
were performed. The case was fatal on the ninth day, and on exami-
nation the small intestines to the extent of about two feet immediately
above the ileo-cæcal valve, were found studded with five large oval
patches of a grayish-red colour. Between the patches small pustules,
some of which were red, others of a grayish-white colour, were detected ;
but the rest of the mucous membrane was pale. M. Andral is too judi-
cious a man to continue in a wrong course ; and he has stated that in
some cases, in which an aggravation of symptoms occurred after blood-
letting, a sudden amelioration took place when cinchona and other tonics
were administered. The cases, however, treated by the former means
furnish ground to Sir Alexander Crichton for considerable comment.

He illustrates his opinion of the inexpediency of the depletory treat-
ment of typhus by two other disorders bearing more or less analogy to
this affection, the malignant thrush fever, occasionally seen in this
country, and common in Holland and Brabant ; and scarlatina. In the
former of these complaints, there are inflammation and thrush in the
mouth and fauces, pains in the abdomen, vomiting, frequent stools in
which aphthous crusts are visible, and an appearance of aphthæ about
the anus. There is inflammation apparently through the whole course
of the digestive mucous lining ; yet bleeding is never employed for it, but
success follows a different line of treatment, namely, deterging the intes-
tinal tract by a combination of antimonials and mild purgatives, and by
supporting the strength of the patient, as much as the heat, headach, and
general febrile symptoms permit, by mild nutritious drinks, such as
barley-water, weak chicken or beef tea, then by wine, and afterwards by
a decoction of cinchona combined with small quantities of muriatic acid.
On descanting on the other disease selected for comparison with typhus,
scarlatina anginosa gravior, Sir Alexander remarks that the membranes
of the mouth, fauces, nose, œsophagus, and meatus auditorius, are in a
state of high inflammation, and then asks, whether it enters into the head
of any good practitioner to attempt to cure this inflammatory action by
taking away forty ounces or even five ounces of blood from the arm ! or,
to apply leeches to the neck and throat, to relieve the swelling ? The
former of these queries we answer at once in the negative ; but to the
latter we reply, that we are constantly in the habit of applying leeches
to the neck and throat to relieve the swelling, and this too, with benefit
to the patient, which, we trust, will relieve us from the imputation of being
bad practitioners for so doing.

We think that arguments against bleeding in typhus, provided that
such bleeding is performed for the purpose of subduing inflammation of
the muciparous glands and mucous membrane, of a more cogent nature
than those deduced from the analogy of thrush and scarlet fever might

easily have been found.   All experienced physicians must have observed
in cases of bronchitis, of muco-gastritis and muco-enteritis existing as in-
dependent diseases, how little beneficial influence is exerted by general
bloodletting on inflammation of mucous membrane and its associated
glandular apparatus. What a contrast does the paucity of effect produced
present to the result of the same measure employed for inflammation of
a serous membrane, in pleurisy for instance ?

    Nature's principle of curing typhus, says our author, is the same as
that by which the paroxysm of an intermittent is terminated; she reduces
the quantity of circulating fluids until she brings about an equilibrium
between them and the enfeebled moving powers.

    This certainly sounds like an argument in favour of bloodletting ; but
Sir Alexander points out, and with truth, the distinction between the
excrementitious evacuation by sweat in intermittent, and the withdrawing
of a portion of the entire and vital blood.   He admits, however, of
bleeding, not to a greater amount than two ounces, in cases of suspected
inflammation, or threatened congestion. We certainly think the bleeding
here mentioned not likely either to subdue the inflammation, or prevent
the congestion.   The question of bleeding in typhus seems to us to be
rather dogmatized upon by Sir Alexander, than examined on sound the-
rapeutic principles. His arguments against it appear to us too universal,
and on the whole overcharged.   Whether this has arisen from his living
on the continent, having witnessed exclusively a low sunk form of typhus
in which evacuants would have proved especially pernicious, or, from his
having been appalled by the sanguinary exploits of some rabid disciple
of Broussais, we know not ; but it has certainly arisen from too limited a
view of the disease and its treatment.   Rules of treatment cannot be laid
down thus universally.   They should be framed conditionally, and ap-
plied according to the precept of the most sagacious of physicians,
Sydenham, " *perspecto genio morbi.*"   Now this " *genius morbi*" differs
very materially indeed in different epidemics of typhus ; of which we will
give an example, on indubitable authority, from the practice of a phy-
sician whom our author frequently refers to and quotes, the late Dr.
J. Clark of Newcastle.   This eminent man, in an epidemic of typhus
which prevailed in Newcastle and its neighbourhood, in the latter end
of the last century, employed his well-known practice of giving bark
with cinnamon water and brandy, with such success that it procured for
him a reputation perhaps unparalleled among provincial physicians. But
in a subsequent epidemic in the same district, the same means, applied
by the same hands, were as signally unsuccessful as in the former case
they had been prosperous.   The worldly circumstances of a patient, and
the locality in which he resides, influence very much the character of the
disease and the mode of its correct treatment. Sir Alexander Crichton
quotes largely from the writings on fever of the Dublin physicians, and
in a spirit of well-merited eulogy. But he would acknowledge that many
practices must be resorted to in the case of the squalid denizen of the
liberties of Dublin, which would be inapplicable to that of the well-fed
inhabitant in the middle or upper ranks of life of a province in England.

    Though holding the opinion that a more extensive view of typhus in
England might have mitigated a certain tone of dogmatism displayed
when he treats of bloodletting, we bear willing testimony to the excellent

judgment manifested in our author's commentary on the other remedies
of the disease. He speaks with well-deserved praise of the effect of
belladonna, first employed, we believe, by Dr. Graves, though the
original suggestion of its employment seems to have proceeded from
Dr. Corringan, in that dangerous form of brain-affection in typhus, in
which the pupil is so contracted as to form what Dr. Graves in his
emphatic language calls the *pin-hole* pupil.   His remarks on the em-
ployment of antimony, of the warm-bath, and of the cold aspersion and
affusion of Dr. Currie, and the circumstances limiting their applicability,
all denote the experienced and prudent physician.

When meteorismus is accompanied by pain on pressure rendering it
probable that inflammation of the intestines exists, he recommends the
application of blisters, combined with the judicious administration of
calomel in small doses united to antimonial powder, or ipecacuanha.
These means we consider to be very judicious, and we would add that
we have found the symptoms mentioned to be very general accompani-
ments of *dothinenteritis*, and very frequent precursors of intestinal
hemorrhage.   When this has occurred we have observed that the in-
ternal employment of acetate of lead has not only allayed the hemor-
rhage, but has appeared to be beneficial to the inflammation and ulce-
ration on which it was dependent. We do not quite concur in our
author's fondness for emetics in fever, especially in the bilious synochus
of this country, which he very aptly compares to the bilious remittent
which prevails along the shores of the Mediterranean. Now in this latter
disease we have ever observed a degree of gastric irritation counter-
indicating the employment of emetics, and pernicious effects have even
to us appeared to result from them.

Sir Alexander's disquisitions on the doctrine of fever are learned and
interesting ; and if we do not give them in detail it will be understood
that it does not arise from any disparaging appreciation of their merit,
but for want of space.   He adopts Liebig's theory of the action of
contagion and other animal poisons, the poison of bad sausages for in-
stance, and expresses it in the following terms : " If the exciting agents
of chemical metamorphosis be a compound body, which is in the act of de-
composition, it will reproduce itself *ad infinitum*, provided the compound
body on which it acts contains elements fitted for such an end."   Sir
Alexander thinks that it is the blood and especially its serum, in which
the metamorphosis chiefly takes place in the case of typhus. To this
conclusion regarding the serum he is led by considering that the low
state of vitality of this fluid presents little resistance to the action of
the poison, contagion. The influence of this poison is next manifested in
the diminution of vital force in the brain, and consequently in the organs
of circulation, those of digestion and of secretion, and so long as any spe-
cific virus or contagion finds materials in the blood, which, by the law
of chemical transformation, it can set in motion and gradually convert
into a compound *ejusdam generis*, so long does the disease continue.
The disorder ceases where such elements have all undergone the trans-
formation or are exhausted.

It must be obvious, since we have no means of destroying this assimi-
lative power of the poisonous agent, that our practice in fever can
amount at best only to a rational empiricism, and that we must learn from

experience how best to combat its effects.   It is gratifying to be con-
soled in this state of apparent impotency by the high authority of Liebig
who informs us that methods, the results of ages of experience, are such,
that the most perfect theory could hardly have pointed them out more
acutely or justly than has been done by the observation of sagacious
practitioners.

Insanity.   The third commentary is on insanity.   It contains not
much that is new, but much that is judicious.   The author's definition
of the disease stands thus :

"Insanity is a disease of the brain which causes the patient, while awake, to
mistake the phantoms and operations of imagination for realities, which, con-
sequently, become the motives of his discourse and actions, while at the time
there is an absence of any bodily disorder that can account for the phenomena."
(p. 165.)

We think that in this definition more things are comprehended than
insanity.   But for its first proposition ("insanity is a disease of the brain"),
which is manifestly hypothetical, it would comprise the error of the touchy
man, who feels and resents as an affront what was not intended, nor
were there *reasonable* grounds for supposing it to be intended, as such ;
but all who have tried having felt the extreme, perhaps the insurmountable,
difficulty of framing a definition of the disease at once comprehensive and
exclusive, we are not disposed to be critical on Sir Alexander's efforts.

He bestows much commendation on MM. Foville and Delaye for their
investigation of the condition of the brain in this disease, expressing the
opinion that this organ has never been satisfactorily examined but by
them.   M. Foville is especially praised for his discovery of the red colour
and manifestly augmented vascularity of the gray or cineritious matter in
fatal cases of acute mania.   In chronic cases only has this writer found
cohesion of the membranes of the brain to its cortical substance.

The plan of treatment, however, which the condition of the organ in
acute mania would seem to indicate, that of bloodletting, is one of which
he does not approve.   He demurs to the conclusion drawn by Foville from
his anatomical observations, that we are justified in employing the most
active antiphlogistic means at the commencement of the disease, to subdue
the inflammation.   On this Sir Alexander remarks, that there are a
variety of congestive states of blood-vessels designated inflammation,
though all of them are perfectly distinct from this state.   We are of
opinion that congestion, or hyperæmia, frequently exists without that
effusion, or those new formations which are of the very essence of inflam-
mation,—that, though congestion is a constituent of inflammation, it is
often found in the absence of this condition.   In stating, however, this
familiar truth, we must guard ourselves from accordance with the classi-
fication of our author, who ranks syphilis, variola, and vaccine, and some
other diseases, with congestive states of blood-vessels.   The diseases we
have named certainly display, in new formations, the characteristics of
inflammation ; but the causes whence these specific inflammations proceed
invest their whole course with a peculiarity, distinct in each disease, and
discriminating them not only from each other, but collectively, from
common inflammation.

On better grounds than pathological research, his own clinical obser-
vation, supported by the high authorities of Pinel and Esquirol, our

author objects to bloodletting.   His favorite remedies, in acute mania,
are tartar emetic in small doses, occasional laxatives, the tepid bath, cold
applications and occasional leeches to the head, and low diet. In a more
advanced stage, with a pale face and feeble pulse, he has given wine,
valerian, and even cinchona with advantage.   He has found colchicum
useful both in acute and chronic cases. In a section in this commentary
on the crimes which are imputed to insanity, Sir Alexander displays a
dread that the wholesome principle of moral and legal responsibility for
actions should be lost sight of in Dr. Prichard's doctrine of moral insanity.
After much attention to Dr. Prichard's views on this subject, and no in-
considerable observation of the disease to which they refer, we have at-
tained the same conclusion as this very able writer, that the moral senti-
ments are, equally with the intellectual powers, liable to *derangement*
from disease; and we cannot concur in any censure of him for having
given his sentiments on the subject freely to the public, considering with
him, that "the real facts of a difficult question must be known in their
true relation, before a solution can be sought with any prospect of
success." *   We would remark, however, that in a considerable number
of the instances of this moral insanity which have fallen under our obser-
vation, intellectual disorder has been associated with it; and we think
that such disorder is discernible in some of the cases related by Dr.
Prichard in the article we have quoted, particularly in that of the lady,
designated A. M——.   But we would not deny that cases occur in which
the derangement is mainly, if not exclusively, in the moral sentiments.
If this truth, and we are convinced that it is one, adds to medical per-
plexities in a case in which they are already sufficiently abundant, we
cannot help it. The clue to the solution of the difficulty must be sought
in the comparison of what the patient's feelings are, with what they have
been. In a case of this kind, we have seen one who had been the fondest
of mothers loathe her children, lamenting bitterly, at the same time, that
she did so.

Syphilis. The volume concludes with extracts, occupying about eighty
pages, relative to the non-mercurial treatment of syphilis, as practised by
the late Dr. Fricke in the hospital at Hamburg.   The plan of treatment
may be summed up in a few words : cleanliness, repose, low diet, and
laxative medicine.   The diet of the patients in the beginning of their cure
consists of four ounces of wheaten bread and about a pint of *soupe
maigre*, with some flour mixed in it, three times a day, and at dinner
six tablespoonfuls of vegetables are given in addition.   The patients
are not allowed brandy, wine, or even *water*. If thirsty, barley-water is
given them.   As soon as the peculiar character of the sores or the com-
plaint begins to disappear, the diet is changed according to the strength
and constitution of the patients. In the progress of recovery animal food
is allowed; but in the case of females, whose treatment seldom requires
more than *three or four weeks'* residence in the hospital, and who require
less food than men, the prescribed diet has continued till their dismissal.

The medical treatment is simple.   Bloodletting is now employed, only
where the patient is of full habit or there is much inflammation.   In
ordinary cases it is deemed sufficient to give the patient, at first thrice
a day, afterwards only once, a tablespoonful of a solution of Epsom salts

* Article on Insanity, (Cyclopædia of Practical Medicine, vol. i. p. 19.)

in fennel water, in the proportion of an ounce and a half of the salt in six ounces of the fluid, called the *English mixture*. We shall not go through the detail of the various local applications employed.

Cases are given in abundance, which prove what every well-informed medical man was already aware of, that syphilis in every form is curable without mercury simply by antiphlogistic means. This, then, is no longer the question. The real subject of inquiry is, ought it to be so treated? Exclusive of the evidence from Dr. Fricke, which properly considered leads, we think, to the same conclusion, but to this we shall subsequently advert, we would say that we have ample reasons for deciding that it ought not. We witnessed for three years in a large hospital, containing always a great number of venereal patients, the simply antiphlogistic treatment of the disease, not a particle of mercury being employed— nay, a great proportion of the patients were treated by ourselves; and we closed the experiment, which as to the question of curability was perfectly decisive, with the conviction that we should have done more justice to our patients had we associated with our antiphlogistic treatment a mild and moderate course of mercury, which conviction subsequent experience has tended to confirm. We argue not for the abuse of the mineral; but such a course as we recommend would, we believe, have abridged the period of treatment, rendered the *sequelæ*, such as eruptions and iritis, much less frequent than we found them, and would rather have spared than injured the constitution of the patients. Sir Alexander is convinced that the method of Fricke will not succeed in private practice, because patients will not submit to the restrictions imposed. We would say further, that it ought not to be followed exclusively in hospital practice.

We have adverted to a reason discernible in Fricke's cases for a less exclusive mode of practice. We find it in the prodigious duration of the treatment. We shall take a few cases in the order in which they stand. Johanna H. was cured of chancre and discharge from the vagina in two months and six days. Lisette Julia M. had a chancre and excoriation; dismissed cured at the end of the sixth week. A case with four chancres on the genitals, and the right tonsil slightly ulcerated and of a deep red colour, cured in two months and fifteen days. In the next case, the patient had undergone treatment prior to admission. Some of the symptoms had disappeared; but a single chancre remained on the glans penis, a line and a half in depth, and six lines wide. The sore at the end of the ninth week from his admission was reduced to the size of a pin's head, when the patient, out of temper from delay, (as well he might be,) departed. He returned eight days after, the ulcer having become larger, and at the end of other three weeks he was at length cured.

Sir Alexander Crichton's explanation of Fricke's success is founded on Liebig's doctrine of metamorphosis by the application of an animal poison. He would say that from the low diet and the purgative medicine employed, the parts of the blood are not supplied which are susceptible of the metamorphosis, the same result being produced as is effected in fever by the annihilation of the desire for food and of the process of chymification. We feel no objection to this explanation; but we would remark that one equally good is offered in the inflammatory character of all the products of the syphilitic virus and the antiphlogistic nature of the course employed.

We now take leave of Sir Alexander Crichton, and, we assure him, with the respect we entertained for him on account of the efforts he has made at his period of life to instruct his brethren—or rather, we should say, his children—enhanced by the value of the lessons he has imparted to them. On some points we have differed from him, and have been free in our expression of this difference; but he has shown himself too candid in declaring his sentiments of others to render it possible that he should be displeased with the display of the same quality in us.

Art. XV.

Traité des Maladies des Reins, et des Altérations de la Sécrétion Urinaire, &c. Avec un Atlas in Folio. Par P. RAYER.—*Paris,* 1841. Tome III. pp. 810.

Treatise on the Diseases of the Kidneys and the Morbid States of the Urinary Secretion. With Folio Plates. By P. RAYER, Physician to the Hospital la Charité, &c.—*Paris,* 1841. Vol. III.

M. RAYER grows upon our esteem. Each new volume of his admirable work, instead of exhibiting marks of its author's weariness, proclaims the vigour of his untiring industry; instead of occasionally giving hint that his curiosity in clinical research begins to flag, uniformly bears testimony that appetite for inquiry may grow by what it feeds on. And when we reflect that a work of such magnitude has been steadily continued, in spite of the constant occupation of time by extensive hospital and private practice, we are tempted to regard its author with stronger admiration than, perhaps, in sober reason, can ever be believed the meed of literary labour.

PYELITIS. Having in his former volumes disposed of the inflammations of the proper tissues of the kidneys themselves, M. Rayer proceeds in that now before us to examine the inflammatory affections of the structures more or less intimately connected with those organs. Inflammation of the pelvis and calices first engages his attention; and of this disease the author may be said (if it be allowable for a moment to adopt the usual but rather pompous phraseology of our neighbours under such circumstances) to have created the history. Pyelitis, the name proposed for the affection, (from πυελος, pelvis,) is in truth, in all that regards precise knowledge of its seat and anatomical characters, but more especially of its symptoms, essentially a novelty to the observer of renal disease. It was invariably confounded during life with actual nephritis, and is still so confounded by the majority of persons; while on the other hand it is not a little amusing to find certain writers, after having had their confusion of ideas on the subject cleared up by the lucid exposition of M. Rayer, suddenly discovering that this very pyelitis was among their oldest pathological acquaintances. That these writers, whose conscientiousness we by no means desire to gainsay, had seen cases of pyelitis before M. Rayer wrote is indubitable; but that they had acquired the power of distinguishing it from nephritis, that they even suspected the existence of such a distinct and in many respects totally different affection, is what, until proof of the affirmative be produced, we conceive ourselves at liberty to doubt altogether.

Pathology and diagnosis. Pyelitis, occasionally occurring as an acute, is most commonly a chronic, disease; and may be considered to be of various species according as the character of the inflammation and the nature of the causes producing it vary; thus we have the simple, calculous, blenorrhagic, gangrenous species, &c. The disease may implicate the entire of both pelves, or a part only of one; it may even be confined to one or more calices.

The anatomical characters of the *acute* form of the affection may be stated as follows: General or partial injection of the mucous membrane, accompanied occasionally with minute petechiæ, or effusions of blood sufficiently considerable to deserve the name of ecchymoses, and in more rare instances with accumulation of a certain quantity of blood in the cavity of the pelvis or calices, are among the more remarkable appearances. In some cases partial deposits of whitish or grayish pseudo-membranous matter are found adhering more or less closely to the surface, a circumstance of importance, as contributing to show that the tendency to formation of plastic exudation, though rarely brought into action on mucous surfaces, yet exists in them all. When the accumulation of this matter is sufficiently abundant to impress a special character on the inflammation, when this is in fact *pseudo-membranous*, the orifices either of the calices, pelvis, or ureter may be blocked up and effectually obstructed; this is the only circumstance under which such obstruction occurs in the acute disease, as thickening of the mucous membrane itself is generally of slight amount. When caused by retention of urine, acute pyelitis may be attended with dilatation of the pelvis and calices and flattening of the mammillæ. The urine in those cases is invariably mingled with pus or muco-pus, discoverable with the microscope when otherwise invisible. The other physical and chemical properties of the fluid vary with the species of pyelitis; it may contain urates, uric acid, phosphates, albumen, &c.

In *chronic* pyelitis, the most common colour of the mucous membrane is dull white; varied here and there with reddish or more frequently brownish injection; if the disease be of very old standing, grayish or slate-coloured patches are far from uncommon appearances. The veins on the exterior of the kidney are sometimes much enlarged, and so arranged as to form net-works. The mucous membrane may have undergone thickening to such an amount as to entail contraction of the orifices of the calices, and even to cause an apparent conversion of those canals into fibrous tissue. We strongly doubt this conversion as described by M. Rayer, and apprehend that in such cases the mucous membrane has been originally destroyed by ulceration or otherwise, and exudation or plastic matter, thrown out on the new surface, hardened into the fibrous-like tissue he has figured. This is probably at least the most common case; there are others no doubt in which the exudation of similar matter *under* the mucous membrane leads to a like result as regards apparent thickening of the mucous membrane and obstruction of the channels for the passage of the urine.

A curious condition observed by M. Rayer in both forms of pyelitis, but in most rare cases, is an eruption of transparent vesicles like the sudamina so common in the typhoid fever of Paris.

Ulcerations of various extent and depth add to the amount of organic change in many cases.   They vary in size from a pin's head to that of a sixpence, or more, and may spread so deeply as to cause complete perforation of the pelvis and the establishment of fistula, communicating with the surrounding cellular membrane, the peritoneum, the duodenum, the large intestine, &c.   It is important to remember that these perforations may occur quite independently of distension of the pelvis, although renal fistulæ do certainly occur most frequently as the final morbid change in cases of atrophy of the kidney, with distension of the pelvis into a huge multilocular cavity.   These ulcerations, more especially when of moderate dimensions, are susceptible of cicatrization, and when so cured present precisely the anatomical varieties observed in healed ulcers of the stomach, and, we may add, of mucous membranes generally.

With the enormous tumours produced by distension of the pelvis with urine, pus, blood, &c., most persons are tolerably familiar, at least as regards the fact that tumours of this description, extending from Poupart's ligament below, to the upper limits of the abdomen above, and driving the liver or spleen upwards into the chest, are not very uncommon morbid appearances.   The atrophy of the renal substances, which coadvances with the accumulation in the pelvis, until this is distended into a simple membranous sac, readily explains the error of the older observers, ascribing these changes all to ulceration and suppurative destruction of the kidney itself.   There is an infinitely rarer species of atrophy of this organ, pointed out by M. Rayer, in which it retains its natural form, while gradually reduced to a less size than that of the kidney of a new-born infant, the pelvic accumulation proceeding as in the ordinary cases.

Chronic pyelitis may be of cancerous or tuberculous origin.   In the latter case M. Rayer, as Dr. Carswell had done previously, finds " tuberculous matter" adherent to the mucous surface.   We shall not stop here, however strongly tempted, to argue the question of the absolutely tuberculous nature of this matter ; for we could not give fair expression to our convictions on the subject, without entering into a disquisition upon the meaning of the word tubercle (or rather upon the nature of the matter of tubercle), in nowise compatible with the general subject now under consideration.   We must venture, however, to question the justness of MM. Carswell and Rayer in terming this substance tuberculous, if by the word we are to understand matter of the same essential nature as the well-known pulmonary product.

Practically considered, there is a very natural division of all cases of pyelitis into those produced by foreign bodies, and those occurring independently of any such influence, as far as our senses are capable of deciding.   And of all foreign materials generating the disease, calculi are beyond comparison the most frequent and the most important.   We shall not enter upon a description of renal gravel and calculi, because these products are generally known in their essential characters, but in tracing, with M. Rayer for our guide, the history of pyelitic symptoms thus originated, refer briefly to the different physical and chemical forms under which calculous deposits occur in the kidneys.

1. When gravel or very minute calculi pass from the calices into the pelvis, thence without great difficulty into the ureter, and eventually reach the bladder, severe pain is felt, but it exists independently of in-

flammation of the mucous surface. But if a calculus be too large to force its way from the calices to the bladder, it gives rise to symptoms referrible to four distinct types, according to their severity and duration.

2. The least severe type is that commonly known as nephritic colic ; the urine is diminished in quantity, and invariably contains mucus and blood ; the latter may be very small in quantity, but the characteristic globules may be readily detected with the microscope. These conditions of the urine, together with the better known pain passing from the kidney to the bladder, vomiting, fainting, &c., cease with the arrival of the calculus in the bladder.

If, on the contrary, the calculous heap or masses, unable to make their way from the renal cavities, remain there, chronic pyelitis is one of the inevitable results. Pain of a dull kind, in the loins, increased by movement and by various modes of pressure acting directly and immediately on the part, or from a distance, diminished in the recumbent posture, extending along the ureter to the bladder and testicle, is one of the most constant symptoms. This pain is subject to occasional exacerbation, when the urine becomes reddish, bloody, and coagulable by heat. The condition of the urine varies in different *emissions ;* sometimes bloody, or containing notable quantities of mucus, at other times perfectly transparent. It is acid, if the gravelly or calculous matter is composed of lithic acid ; alkaline, if this consist of phosphates.

3. In the third state irregular rigors, of frequent occurrence, are observed ; the urine, sometimes bloody, is more commonly whitish and turbid, and deposits a greenish white sediment, composed of pus and salts. All this may occur, without the formation of appreciable tumour, and the case terminate fatally by exacerbation, attended with increase of pain, diminished secretion or suppression of urine, nausea, vomiting, fever, &c.

4. Another condition of the disease is marked by the coexistence of purulent urine and renal tumour,—a tumour which may acquire such magnitude as to weigh from ten to fifty pounds. Posteriorly this tumour gives a dull sound under percussion, as likewise anteriorly, unless the colon in front of it be distended with gas : on the right side it may eventually push away the colon, and form a continuous mass with the liver ; to mark out its limits becomes, under these circumstances, impossible. When the mass has attained a certain bulk, it always appears tuberculated, and is the seat of obvious fluctuation. Pain appears rarely to exist with any severity ; some patients fancy they feel calculi moving about in the tumour, and a particular sort of shock or fremitus has, it is alleged, been felt by observers. M. Rayer doubts the accuracy of the latter statement, and appears to believe its authors deceived by friction of the anterior wall of the abdomen against the surface of the tumour.

It is a matter of great practical importance to bear in mind that the physical properties of the urine are liable in this affection to vary greatly within the same twenty-four hours : it may be at one time loaded with pus, at another present its natural aspect. M. Rayer appeals to the easy explanation of the peculiarity afforded by supposing the urine to be at one time furnished by the healthy, at another by the diseased kidney. This explanation assumes that such variation in the condition of the urine does not occur where both kidneys (as is rarely the case, however,) are implicated.

The coagulability of the urine by heat and nitric acid is not in the direct ratio of the amount of pus it contains.

5. The fifth condition described by M. Rayer is that of atrophy of the kidney, without purulent secretion. This state occurs where the mucous membrane of the calices and pelvis in contact with a large-sized calculus becomes hardened, thickened, and so altered in structure as to lose its power of secreting. If the opposite kidney be healthy, there are no known means of detecting this morbid state during life; and cases are not exceedingly uncommon in which an amount of secretion, little if at all below the natural standard, has been maintained by means of an hypertrophous condition of the other organ.

The diagnosis of calculous pyelitis is most minutely investigated by M. Rayer, each of its symptoms being separately considered in its points of resemblance and dissimilarity to the same symptom when produced by other affections. Lumbar pain, a prominent symptom of pyelitis, may exist in nephritis of various kinds, in cases of hydatids of the kidney and ureter, in nephritic colic, in retention of urine without inflammation, in lumbago, in certain diseases of the lumbar spine, in psoitis, in aneurism of the descending aorta, in pregnancy, in certain diseases of the uterus, in certain cases of partial peritonitis, and in inflammation of the subperitoneal cellular tissue of this region. We cannot follow M. Rayer in his enumeration of the distinctive characters of pain originating from each of these causes, but select the paragraph referring to lumbago as an example of the whole:

" In lumbago the pain commonly affects both sides at once, and with about equal intensity; it is always increased by movement of the trunk; most generally it is unattended with fever, and sometimes preceded by other muscular or articular pains. In pyelitis the pain is almost always felt on one side only (double calculous pyelitis is rare), or at least with unequal intensities on both sides; it is increased, no doubt, by muscular contraction, but not with anything like the severity felt in the instance of lumbago. However, it is not always easy to distinguish the two species of pain." (p. 31.)

That renal calculi, of considerable size, may exist without causing pain, is demonstrated by not a few cases reported, with the results of dissection, by Baglivi and others.

The excretion of purulent urine is not peculiar to pyelitis. But the affections which may be attended with this symptom are some of them so rare—mere accidents in pathology, indeed,—that it is unnecessary to examine particularly into their characters; to this class belong abscess of the subperitoneal cellular tissue opening into the urinary passages, suppurative psoitis, or accumulations of pus in the ovary, following a similar course. Cystitis, on the other hand, whether acute or chronic, is a comparatively common affection, and leads likewise to impregnation of the urine with pus. When, in addition to absence of pain and tumour in the loins, the urine is stringy and viscid, the affection is commonly set down as vesical; but it must be remembered that this viscidity is the mere result of the action of alkali on pus, and would occur in the case of pus conveyed from the calices and pelvis, provided the urine were alkalescent. Besides, pus discharged from the bladder is not always ropy. These facts, insisted on by M. Rayer, show the importance of not trusting to the mere condition of the excreted pus as a distinctive sign of the

two maladies, when information can be derived from other sources; nevertheless we are satisfied from the author's own descriptions, and our own comparatively limited experience, that the conditions referred to are extremely valuable guides in the distinction sought to be established. M. Rayer raises his voice against the opinion that when derived from the kidney the purulent matter is voided after the urine, or at the end of micturition; he maintains, and this we have likewise seen, that whatever be its source, it is voided mixed with the urine, and discharged only more abundantly at the close of the act.

Our author next enters into a most elaborate examination of the distinctive signs of all tumours which may be confounded with that produced by pyelitis, with retention of pus, urine, blood, &c. in the distended pelvis. We cannot follow him through the abundant details furnished under this head, but shall extract the list of affections capable of giving rise to error of diagnosis, and then add a specimen of the manner of distinguishing them:

" The tumours capable of being confounded with those produced by chronic calculous pyelitis are, on the left side, all those resulting from morbid development of the spleen; on the right side tumours of the liver and of the gall-bladder; on both sides various renal tumours of a different nature (hydronephrosis, abundant accumulation of blood in the calices and pelvis, cancer and tuberculous disease of the kidney, acephalocysts in that organ, &c.,) extra-renal abscess either idiopathic or consecutive to perforation of the kidney, of the colon or cæcum; abscess from caries of the spine; tumours proper to the supra-renal capsules; aneurism of the aorta; encysted tumours containing various fluids or acephalocysts; and lastly stercoral tumours produced by the accumulation of fæces in the colon and cæcum." (p. 37.)

The distinction of the last-named tumour from a renal tumour produced by chronic pyelitis is not so easy always as might on first consideration appear, especially if fecal accumulation have occurred in a person who had previously laboured under urinary symptoms.

" However, tumours formed by the ascending or descending colon obstructed with feces, are commonly more elongated, less broad, and of a more distinctly cylindrical form than renal tumours. On the right side stercoral tumours are commonly prolonged towards the cæcum, which gives a dull sound in some points, a clear one in others from distension with gas. On the left side the stercoral tumour passes towards the iliac fossa and cavity of the pelvis. We may often ascertain at the same time that the transverse colon contains hardened fæces. Stercoral tumours are more common on the right than the left side, and when they are painful to the touch and under pressure, this is generally more marked before than behind; while the contrary is, in the majority of cases, the fact in morbid dilatations of the kidney, when there is no inflammation of the corresponding part of the peritoneum. Lastly, stercoral tumours disappear after one or two active purgations." (p. 44.)

Treatment. The directions given by M. Rayer for the treatment of pyelitis in the different states already referred to, are sound and judicious; but as they present little that is actually novel or otherwise very interesting, with the exception of his remarks on the subject of nephrotomy, we shall limit to these our notice of this portion of his chapter.

Nephrotomy. If a pyelitic collection of the kind we have been considering exists in a subject otherwise of a good constitution, and is habitually painful and the source of fever and of derangement of the stomach and bowels; if the pain frequently increase in violence and is attended

with complete suppression of urine, or symptoms of inflammation of the
surrounding parts, the operation of nephrotomy, notwithstanding its diffi-
culty and the chances of failure, should, according to M. Rayer, be prac-
tised. The indication for the operation will of course be stronger if there
be extra-renal abscess or perforation of the sac formed by the distended
pelvis.   The author's motives for giving this advice are that, left to them-
selves, pyelitic collections are almost invariably fatal, unless they open
externally by spontaneous perforation ; that the operation itself presents
no immediate danger ; no large vessels are exposed to the knife, there is
no abundant hemorrhage, at least in the great majority of cases, to be
feared, and no risk of opening either the peritoneum or intestine incurred.
We must refer to the original work for most precise directions as to the
method of fixing the situation for performing the incision, &c. The only
real objection to the operation M. Rayer considers to be the difficulty of
breaking down and extracting such calculi as may be contained in the
pelvis, and this part of the operation may be deferred, as the immediate
and essential point is gained, the evacuation of the fluid collection in the
cavities of the kidney. M. Rayer refers to numerous cases of indubitable
success on record, as forming the final justification of nephrotomy under
the circumstances ; but, as he himself admits, in some of these instances
the operation performed did not in reality deserve this name, as the
calculus had either already escaped spontaneously into an extra-renal
abscess or the surgeon had contented himself with incising the walls of
an extra-renal abscess, leaving the perforation of the pyelitic sac and the
escape of the renal calculus to be accomplished by a natural process.

Such being the circumstances which, according to the learned author, war-
rant the operation, the absolute contraindications claim to be mentioned.
These are the existence of renal calculi upon both sides, (unless, however,
in the case of *extra-renal* abscess, which should always be opened ;) the
circumstance of the pus flowing freely from the pelvis into the ureter,
without the existence of renal tumour or fair motive for apprehending
rupture of the kidney, and above all of a good state of the general health
justifying the notion that the unaffected kidney supplies by increased
action the want of the diseased one ; and finally the fact of the existence
of severe organic disease either in other parts of the urinary organs or in
other viscera.

Of the three methods employed for effecting an opening into the dis-
tended pelvis, namely incision, incision of the external parts and punc-
ture of the sac with a trocar, deep cauterization followed by incision,
M. Rayer prefers the former.   For considerations regarding the mode of
operating, the extraction of the calculus, &c., we refer to M. Rayer's
own pages.

M. Rayer next proceeds to examine the peculiarities of other species
of pyelitis ; to these as described in the original we recommend particular
attention, as they are more especially the varieties of the affection, (e. g.
simple, verminous, &c.,) to which our opening remarks respecting their
novelty to practitioners refer.   A series of admirable cases and an his-
torical sketch of the progress of knowledge respecting calculous pyelitis
concludes this division of the subject.

Pyelo-nephritis. Under this name M. Rayer designates the associa-
tion of inflammation of the renal tissues and of the pelvis and calices,

which is of more common occurrence than either of these affections sepa-
rately. The pelvis and calices are generally first seized; the renal sub-
stances rarely earliest implicated. The causes of the disease are those
of simple pyelitis; it may run an acute or chronic course, and may be
simple, calculous, albuminous, or hemorrhagic and gangrenous. In these
cases there is a combination of the purulent urine of pure pyelitis with
the other morbid states of that fluid and the *general symptoms* observed
in nephritis; these symptoms do not exist in pure pyelitis. In the treat-
ment of the double disease it is in the great majority of cases important
to attack the inflammation of the renal substances first.

PERINEPHRITIS. This is the name given by M. Rayer to inflamma-
tion of various kinds of the tissues—adipose, cellular, and fibrous—sur-
rounding the kidneys. This affection may be secondary, succeeding
then to nephritis or caused by infiltration of urine; or it may be primary,
produced by contusions in the loins, the impression of cold or damp, &c.
When *acute* and recent, the delicate cellular tissue interposed between
the kidney and its fibrous capsule is traversed by vessels abundantly
injected, sometimes infiltrated with serosity or pus, or the latter is col-
lected into small abscesses. The accumulation of pus may, observes
M. Rayer, be so considerable as to cause rupture, by distension, of the
capsule. The external cellular tissue, especially that behind the kidney,
sometimes becomes the seat of collections of pus; the lumbar subcuta-
neous cellular tissue is infiltrated with serosity, and this œdema com-
bined with fluctuation furnishes one of the best signs of extra-renal
abscess. Accumulations of this kind may eventually communicate with
the intestine or the bronchi.

In cases of *chronic* perinephritis the subfibrous cellular tissue of the
kidney may grow remarkably thick, either generally or in various points,
which may have a black colour and form prominences on the surface.
The fibrous capsule may adhere so firmly that it cannot be removed
without tearing; it may be the seat of cartilaginous and osseous de-
posits.

Diagnosis. There may be very great difficulty in the diagnosis of
primary abscess of the cellular tissue around the kidneys. The pain
complained of is more deeply seated than in lumbago; the lumbar region
is not altered in shape; if there be fever the urine is red, as in inflam-
matory diseases, without presenting any of the characters peculiar to affec-
tions of the kidney or pelvis; the pain spreads; the fever increases; sub-
sequently the flank becomes arched and œdematous, and percussion
(which is painful) shows that the enlargement has been chiefly affected
posteriorly. Collections of this kind should be opened the moment their
nature is ascertained; they generally do well, in surgical phrase, and
cicatrize with satisfactory speed. When the abscess is consecutive to
calculous pyelitis, on the contrary, fistulæ often delay the progress of
the case to cure for years.

RENAL FISTULA. We next come with the author (passing over his
collection of cases of perinephritic abscess) to the history of renal fistulæ.
These fistulæ are generally induced by the presence of one or more
calculi in the pelvis or ureter, and may open either into the extra-
peritoneal cellular tissue, or externally in the lumbar region or the
crural arch, or into the colon, the duodenum, the cavity of the perito-

neum, or finally into the pleura or lung of the corresponding side.
Examples of each of these species of fistulæ are related by M. Rayer,
derived either from his own experience or from periodical records. We
recommend to the curious in pathological anatomy, a careful perusal
of the cases of reno-pulmonary fistula, which we regret our limited space
forbids us to extract.

RENAL HEMORRHAGE. The important subject of renal hemorrhage
receives full investigation at the hands of M. Rayer in a chapter ex-
hibiting his excellent powers of precise description and methodic arrange-
ment to the very best advantage.   Renal hemorrhage is of three distinct
kinds : it may be symptomatic of certain lesions of the kidney ; it may
be symptomatic of certain general diseases ; and finally it may be idio-
pathic.

The anatomical characters of renal hemorrhage are minutely described :
we must content ourselves with a reference to all varieties except that
termed *renal apoplexy*, which we have not seen elsewhere distinctly
mentioned.

" On the surface of the affected kidney, knotty, irregular tuberculated emi-
nences are perceived, some of them of deep black colour, others of chamois-
coloured tint, more or less pure or variegated with black parts; all, or almost
all, these eminences are surrounded by deep brown lines. Under a lens the
substance of the kidney appears swollen with black blood; its tissue is granu-
lated ; neither clots nor lacunæ resulting from the absorption of the liquid can
be anywhere perceived ; the blood is infiltrated and ultimately combined with
the renal substance."

The last sentence seems to involve an error, the more requiring cor-
rection because a common one : it is not possible in truth that blood, or
any other material, should be at once infiltrated through and combined
with a tissue.

Bloody urine coagulates with heat and nitric acid, and presents under the
microscope the characteristic blood-disc, which acquires an irregular con-
tour after some sojourn in the urine. Pure unaltered blood, or nearly so, is
very rarely voided, unless in cases of wound or laceration of the urethra :
in abundant renal hemorrhage the blood commonly coagulates in its pas-
sage, either in the ureters or bladder. In some cases the urine con-
tains so small a quantity of fibrine and discs that it has a very slight
pink colour only, and deposits no coagula, and it would be impossible
to affirm that such urine contains blood without the aid of the micro-
scope.   Of the importance of this observation we are fully persuaded,
having ourselves detected blood-globules in some quantity in the urine
of a patient who, for several weeks continuously, passed urine which
presented *no* appearance of impregnation with blood to the naked eye.
M. Rayer well observes too that the daily quantity of blood voided in a
case of renal hemorrhage cannot be determined by the inspection of one
or two specimens of the urine. This fluid may sometimes be discharged
transparent; when a huge clot fills the bladder almost, and when a
coagulum accidentally blocks up the ureter on the side of the kidney
furnishing the hemorrhage, the other organ of course furnishes natural
urine, which might betray the physician into the notion that all hemor-
rhage had ceased. It must, however, be admitted with M. Rayer, that
the variations observed in the quantity of blood passed at different

periods during the day in renal hemorrhage are not always explicable; he has found nevertheless that it was more considerable than usual in the urine voided about three hours after meals.

The duration of renal hemorrhage is with difficulty foreseen. Hematuria sometimes ceases in a day or two in cases of calculous pyelitis; in other instances continues for months together. In cancers of the kidney, hemorrhage may be a persistent symptom, varying no doubt much in its amount from day to day, or week to week, but never wholly ceasing. The extent of the hemorrhage may be so great as to prove fatal; such is the immediate cause of death in some cases of cancer of the kidney; and idiopathic renal hemorrhage sometimes has proved similarly destructive to life.

A question of very considerable practical importance is,—being given a case of hematuria, how is the source of the hemorrhage to be determined? The circumstances leading to the belief that the blood comes from the kidneys are the existence of the feeling of a weight or dull pain, increased by firm pressure, in one or both renal regions; the absence of all organic lesion of the excretory organs of the urine; and in other cases the existence of some general malady of the system which experience has shown to be not uncommonly attended with effusion of blood from the kidneys. It must be remembered, however, with regard to the first of these characters that in "essential" renal hemorrhage the renal regions may be perfectly indolent, even under the strongest pressure.

Hemorrhage from tne ureters is rare; the only cases in which M. Rayer has observed it were examples of calculous ureteritis; and in two cases of the kind where the hemorrhage was frequent and abundant, the blood was furnished in great measure by fungous vegetations seated in the neighbourhood of a calculus. As during life both the ureter and the kidney were the seat of pain, the former from the calculus and fungus, the latter from the retention of urine, it was impossible to determine by which the blood was furnished.

With the exception of cancerous fungus of the bladder, and calculous and tuberculous cystitis, there are few affections of that viscus which give rise to hematuria; and the diagnosis of these is rarely, according to M. Rayer, attended with difficulty. We confess that this alleged facility is more than we could, either from our own capabilities or from what we have recognized to be the share of other persons, have anticipated to exist in respect of tuberculous cystitis. The detection of the other maladies is in truth easy to all.

When the blood comes from the urethra it flows without the patient's passing urine; and urine removed from the bladder by catheterism contains no blood, unless the lesion of the urethra be near the neck of the bladder, or the blood in consequence of some obstacle not being able to make its way outwards, regurgitates into the bladder.

In cases of renal hemorrhage the effused blood sometimes, either in consequence of its coagulation, or of some obstruction to its escape, accumulates in the pelvis and calices, and distends these cavities enormously. Walther published, in his book on Renal and Vesical Diseases, the very remarkable case of a young girl whose abdomen was sufficiently large to simulate pregnancy of seven months' duration (she was universally be-

lieved to be pregnant), and in whom the enlargement was, after death, found to depend upon enormous accumulation of blood in the kidneys; the hemorrhage was caused by calculi. Other cases, similar in the main, are on record.

Hemorrhages symptomatic of renal injury or disease are among the most important in their relations, if not from their actual amount, which fall under the notice of the physician. We need not return to the subject of injuries of the kidney causing hematuria, noticed in one of our former articles, except for the simple purpose of reminding the reader that nephritis (traumatic) is a very common complication in such cases, and requires the practitioner's attention after the bleeding has been arrested.

All species of nephritis may be accompanied with renal hemorrhage. Even the *simple* inflammation is much more commonly so attended than is usually imagined; and it is important to observe that in albuminous nephritis (Bright's disease) the urine frequently contains blood-discs, when not obviously discoloured to the naked eye. In rheumatic and gouty nephritis, hemorrhage similarly attends the acute period of the disease, and passive hemorrhage occurs in nephritis produced by the action of " morbid poisons" on the system.

Calculous pyelitis is one of the most frequent sources of this hemorrhage, as might be deduced from much that has been already said; and the verminous species (produced by strongyli—a rare entozoon, however, in the human subject), has been not unfrequently known to give rise to hemorrhage.

Of degenerations of the kidney causing effusion of blood, the cancerous and tuberculous are by far the most important. In another part of this article we shall have occasion to return to the subject.

Of the general affections of the system capable of causing effusion of blood from the kidneys, some are of the hemorrhagic species,—for example, purpura and scurvy. Hematuria is much more common in the former of these diseases than the latter; and it is curious to observe the manner in which, as the hemorrhage ceases, the different elements of the blood disappear from the urine,—first, the fibrine ceases to be discoverable, then the blood-discs, while the albumen remains still sometimes readily discoverable. Such is, no doubt, the ordinary course of things in hematuria of every kind originating in the kidneys.

The tendency of numerous substances injected into the veins to pass off by the kidneys is well known, and it is very remarkable that in animals submitted to transfusion, the blood transudes through the kidneys in numerous cases. Of fifty animals thus experimented on, twenty, according to P. Frank, had hematuria.

The eruptive fevers, yellow fever, and continued fever, are not unfrequently accompanied with bleeding from the kidney; and there are certain agencies of less importance, which, after having acted upon the system generally, and on the blood in particular, determine hematuria, commonly of slight amount. Thus, according to M. Rayer, individuals struck with lightning have been known to pass blood with the urine; and the effect of certain substances, as cantharides, in this way, is well known;—the use of balsam of Peru, garlic, onions, asparagus even, in large quantities, is said to be followed by a similar result. M. Rayer has met with one case of lead-colic attended with hematuria, and that

the latter depended upon the same cause as the former—the absorption of lead—seems proved by the fact, that with the decrease of the colic the discharge of blood gradually diminished also. It is much more common, according to this author, to detect albumen than blood in the urine of these patients; but as in several cases observed by him the albuminuria persisted after the cure of the colic, it is more than possible that some amount of Bright's disease may have existed in the kidneys.

Idiopathic, or essential renal hemorrhage, that occurring independently of local, organic, or general disease, an affection of much rarity in these countries, but apparently common in certain tropical regions, is treated of under five different heads by our author. This species of hemorrhage may, he considers, be *continuous, intermittent* or *periodical, supplementary, critical,* and *endemic.*

1. As examples of the continuous essential variety two cases are related, in one of which a very slight degree of bleeding was remarked, while in the other the renal hemorrhage actually proved fatal. Whether the title of essential can be fairly given to the hematuria in these cases, seems matter of doubt. In the case of slight bleeding there was pain in one renal region, and the hemorrhage was stopped by antiphlogistic treatment; in the case of severe hemorrhage, there were manifest evidences of chronic renal inflammation detected after death. Nevertheless it may be urged, that in the last case the bleeding was altogether out of proportion to the inflammation, and could therefore scarcely be considered a mere dependence upon it.

2, 3. Of idiopathic *periodical* hemorrhage from the kidney, M. Rayer has himself observed no example, and believes that such a discharge, unless when *supplementary* of the catamenia, or hemorrhoids, or connected with intermittent fever, must be extremely rare. The interest of the information collected from various sources, on both these varieties of hematuria, will reward its perusal.

4. Upon *critical* hemorrhage, M. Rayer has nothing new to offer, and his collected materials are meager and unsatisfactory: at both these circumstances we by no means wonder; such hemorrhages have doubtless been often, if not always, imaginary, that is in their *critical* character.

5. M. Rayer's chapter on the endemic hematuria of the Mauritius is replete with interest; and although the subject may not have immediate practical importance in the eyes of persons practising in Great Britain, we have the advantage of our colonial readers sufficiently at heart to indulge them with a brief summary of M. Rayer's elaborate investigations of this very curious malady. It occurs especially in children, and in three principal forms,—those of simple hematuria; hematuria with uric acid gravel; hematuria with chylous (albuminous and fatty) urine. The influence of heat of climate in its production would, at first, appear obvious from the localities in which it occurs, (it is observed also in Nubia and Upper Egypt,) and its absence in temperate countries, were it not for the fact of its absence in so many other climates equally hot. The quantity of blood voided varies extremely; it is sometimes so small that no coagula are formed, and micturition is accomplished without pain; some emissions in the course of the twenty-four hours may be altogether bloodless. In the most favorable cases it would even appear that several days may from

time to time elapse, without any appearance of blood in the urine, when at length the discharge recurs, without appreciable cause; children affected with this comparatively benign form of the disease are able to pursue their studies, and retain the outward habitus of health.   In cases of greater severity, coagulation of the blood in the bladder may give rise to retention of urine and its consequences, while repeated loss of the vital fluid renders the child pale and languishing.   Nevertheless M. Rayer is inclined to believe, both from what he has himself observed in natives of the island removed to France, and from what he has been able to ascertain, that loss of blood is rarely carried to such an excess as to render the constitution cachectic, and lead to general dropsy.

The sediment of the urine in this disease is almost wholly composed of blood, or of blood-discs and crystallized lithic acid, the latter accumulated sometimes in sufficient quantity to form gravel, capable of causing nephritic colic, and obstructing the secretion of the urine.   The frequency of this gravel in the youth of the Mauritius makes it a question of interest whether adults suffer in a higher proportion from stone than those in other countries; this M. Rayer's information does not enable him to say.

In another form of the disease the patient passes two distinct kinds of urine in the twenty-four hours.   One of them is ordinary bloody urine; the other, which appears to be usually elaborated some hours after digestion, is of a pale red colour.   The latter separates, by standing, into two parts, the lower of which is bloody, the upper opaline, and of a milky white colour, or completely opaque.   Examined under the microscope, this white portion is found to contain, commonly, blood-discs—and fatty matter not presenting the globular form may be removed by ether and evaporation; in some cases, however, no blood-discs are to be found.   It invariably contains albumen, and is not deficient in urea.   Compared with a mixture of healthy urine and rose-coloured chyle, taken from the receptaculum chyli in a horse, the resemblance of the two liquids—the artificial chylous urine and the natural chylous urine—struck M. Rayer as being most forcible.   In both these were globules, having the aspect of those of the blood; in both there was albumen, and a small quantity of fibrine; and lastly, both contained a considerable amount of fatty matter.   Further, albumino-fatty urine resembles urine to which the organic elements of the chyle, minus its globules, had been added; and " this species of chylous urine," adds the author, " considered in its relations to the chyle, was evidently analogous to albuminous urine derived from the blood."   In two cases, referred to by M. Rayer, it was ascertained that this species of hematuria, with chylous urine, coexisted with a peculiar alteration of the blood,—this fluid resembling in its constitution the chyle of the thoracic duct.

Persons voiding chylous urine often enjoy apparently good health; gout and lithic acid deposit in the urine are sometimes observed as coexisting states.

The endemic hematuria of the Mauritius, whether simple or complicated with lithic-acid gravel, or replaced by chylous urine, always affects a chronic course.   The hemorrhage sometimes ceases for several days, or even weeks, then returns, and continues with remissions or intermissions of variable length, for years.   In addition to the influence of climate,

already alluded to, on the production of this disease, it appears, from its persistence in some cases for years after the removal of the patient to Europe, that it may become a constitutional state.

M. Quevenne analysed the urine of a female, aged seventy-eight, who had voided albumino-chylous urine from the age of twenty-five to seventy-five; at the latter age, the renal discharge became natural, and the patient believed herself cured. After about a month spent at sea, on her voyage from Bourbon to France, the chylous condition returned with greater intensity than ever. Examined with the microscope, the fluid was found to contain altered blood-discs, globules like those of pus or mucus, and epithelium scales. On analysis 100 parts furnished,

Aromatic fatty oil	-	-	-	1·90
Albumen	-	-	-	0·70
Extractive and saline matters, divisible into extractive matter soluble in alcohol and lactate of urea		-	-	1·20
Extractive part, insoluble in alcohol and salts consisting of chlorides, phosphates and sulphates, and uric acid		-	-	1·10
Water	-	-	-	95·10

100·00

M. Rayer observes (and the observation is perfectly applicable to England,) that although it is common in Paris to meet with affections in which the urine contains albumen, with or without blood-discs, true renal hemorrhage (comprising all varieties, of course,) is rare there. P. Frank has made a similar remark in respect of Vienna and Pavia. Of 1913 patients treated by him during seven years at Vienna, one only laboured under hematuria; of 13,467 persons dying in the general hospital at Vienna, one only was carried off by hematuria; and lastly, of 4000 persons affected with severe and rare diseases, and treated at the Clinical Institute at Pavia, in the course of ten years, six cases, only, of spontaneous hematuria occurred.

HYPERTROPHY OF THE KIDNEYS. This disease, that is, pure and simple enlargement without appreciable change of structure, is one of the rarer affections of those organs. It may be general or partial, and affect both or only one kidney. In almost all cases of absence of one kidney, the existing one is notably larger and heavier than natural, and may even weigh as much as both kidneys together of a subject of the same age; the caliber of the renal artery is then double that usually observed. This sort of excess of volume of one kidney is also noticed in many cases, where the other is small and rudimentary; and also where this other has been rendered unfit to perform its functions by disease. In cases of partial disorganization of the kidneys, the parts not implicated may become hypertrophous, whence arise curious alterations of shape of the organs, the nature of which does not always on first sight appear obvious.

Hypertrophy of *both* kidneys is sometimes a congenital state, when it invariably coincides with unusually great development of the renal arteries. This condition is likewise an observed effect of certain morbid states of the kidney attended with excessive secretion of urine—saccharine diabetes, for instance. In this disease, the hypertrophy implicates the cortical substance especially; the caliber of the vessels generally is

also manifestly increased, and the corpora Malpighiana are more apparent than natural. As excess of functional activity on the part of the kidney may become a cause of its hypertrophy, so its hypertrophy may, in turn, augment the secretive action of the organ.

Hypertrophy of the kidneys has been met with in the fœtus: Osiander has even related a case in which both were so enormously enlarged as to obstruct parturition in the mother.

ATROPHY OF THE KIDNEY. The converse state, atrophy, is liable to affect the kidney under a considerable variety of circumstances, and may be limited to one, or a part of one organ, or exist in both. Atrophy, as a congenital state, may be explicable by unnaturally small caliber of the renal artery; or there may be no particular condition of that vessel capable of accounting for it. When developed after birth, atrophy of the kidney is the result of pressure. If this unnatural pressure be set in action at an early period of life, a suspension of development is the mode in which the atrophy is directly produced; if at a more advanced period, absorption of the renal tissue occurs, the kidney either retaining more or less accurately its natural form, or appearing like a mere appendix to the dilated pelvis and calices. Accumulations, of various kinds, in these cavities—pus and urine, and serous fluid—is the most common cause, in truth, of renal atrophy, and may diminish the quantity of actual kidney to such a degree that the stratum formed by it is not thicker, or very slightly thicker, than the external and internal membranes of the organ. Tumours of various kinds, developed in the substance of the kidney, determine its partial absorption; and growths or accumulations in surrounding parts—tumours of the liver or spleen, extensive abscesses in the lumbar cellular tissue, enlarged supra-renal capsules, &c.,—occasionally produce the same effect.

Atrophy may be confined to one of the renal substances, especially the cortical. It is sometimes connected with development of cysts, which in its turn may, according to M. Rayer, be or be not consecutive to partial inflammation of the renal tissue. The author has ascertained in the human subject and in animals the occasional connexion of certain partial atrophies with a very remarkable lesion of the tubular substance. The terminations of several mammillæ were in these cases flattened and infiltrated with a transparent substance of mucous or jelly-like appearance; the portions of cortical substance corresponding to the cases of these diseased mammillæ were depressed; and on the surface of the kidney little islets of cortical substance appeared resting on a grayish fibrous fundus.

Atrophy of a single kidney being almost always accompanied with supplementary development of the other organ produces no appreciable symptoms. When both organs are atrophous to a considerable extent there is derangement of the secretion of urine, and nervous phenomena, consisting of convulsions, trembling, and coma, are most commonly observed.

HYDRONEPHROSIS. M. Rayer proposes the name hydronephrosis for that condition of the kidney (referred to by others as *renal dropsy* and *hydrorenal distention*,) in which the urine accumulates slowly in the kidney without giving rise to inflammation of the pelvis or calices. The immediate cause of the accumulation is of course obstruction to the pas-

sage of the urine into the bladder; and the causes of this obstruction are, in turn: the presence of foreign bodies (calculi,) of entozoa (acephalocysts,) in the urinary passages; thickening and swelling of the walls of the ureters, or tumours protruding into their interior; vascular septa running across them; obliteration or contraction of those canals, &c. The distention in the majority of cases in the human subject affects both the pelvis and calices, and is commonly general. In the commencement when the dilatation is slight, the tissue of the kidney presents its natural degree of firmness; subsequently its surfaces grows tuberculated and misshapen, and the prominences on the surface feel soft and fluctuating. The pelvis and upper part of the ureter greatly distended usually form a pyriform tumour within the hilus of the kidney, having its point inferiorly.

When the organ is divided into an anterior and a posterior half the following appearances are seen. When the distension is slight, the pelvis is dilated, and the mammillæ more or less depressed; each calyx appears elongated and funnel-shaped in consequence of the widening of its base. The surface of the mammillæ becomes concave and rough to the touch; and in a more advanced stage the calices are enlarged into so many globular sacs, not communicating with each other, but opening all into the dilated pelvis. The surface of the pelvis is almost always of a pure white colour, and opaque; sometimes it presents lines having a mother-of-pearl lustre, and it scarcely ever contains visible blood-vessels. Atrophy of the renal substances occurs in the manner already described, and the cellulo-fibrous capsule of the kidney may undergo numerous changes. The liquid in the pelvis has always been found by M. Rayer to contain urea and a notable quantity of albumen when the hydronephrosis was of old standing; when the obstacle to the flow of urine was not complete, the fluid in the pelvis scarcely diffused from healthy urine. The absence of pus and other evidences of inflammation distinguishes these cases from pyelitis with distension.

Partial hydronephrosis, or the formation of small urinary cysts, may occur in one or more calices from the obstruction of their orifice of communication with the pelvis; or in the tubular cones from the obstruction of the opening of the mammillæ into the calices; or finally in the cortical substance. All these conditions M. Rayer observes are extremely rare in the human subject, but common in the ox.

When one kidney only is affected with hydronephrosis, the existence of the disease cannot be established until it has increased to such extent as to produce a soft fluctuating tumour in the renal region. This tumour may vary in size, according to M. Rayer, from that of the fist to that of the uterus in the last months of pregnancy. Its extent may generally be pretty accurately defined by percussion, and the tuberculated character of its surface ascertained by careful application of the hand. Tumours of this kind can only be mistaken in regard of their form for cysts of the kidney or accumulations of pus and blood in the pelvis and calices; in speaking of pyelitis we referred to the marks of distinction of the latter malady. Intercurrent inflammation may take place in a case of hydronephrosis and affect a more or less extensive surface of the pelvis; under these circumstances it would be very difficult to determine the true nature of the case, if then seen for the first time. M. Rayer has never met with an example of hydronephrosis terminating by the formation of a fistulous

communication with the intestine, which is far from uncommon in true pyelitis.

In cases of hydronephrosis of one kidney, the disease appears, even where the distension is enormous, to be almost innocuous *in itself:* what constitutes the real danger is the chance of obstruction of the opposite ureter or inflammation of the opposite kidney. In a patient referred to by König in his chapter " Wassersucht der Nieren," a patient is stated to have lived twenty-three years with the disease ; in another case observed by M. Rayer the first symptoms were noticed fifty years before death, which occurred at last from impaction of a calculus in the ureter of the opposite side. In cases of hydronephrosis of both organs the danger is proportional to the amount of atrophy of the renal tissues. All cases are more or less rapidly fatal, and it is well for the practitioner to be guarded in his prognosis, as the patient rarely keeps his bed until a few days before death, which occurs most commonly in a rapid and unexpected manner. A new-born infant affected with double hydronephrosis is not " *viable.*"

The only important point connected with the treatment of this malady is the question of the propriety of giving issue, by an opening in the renal region, to the accumulated fluid. König advised that these tumours should be punctured with the trocar, whenever they increased manifestly in size, and became fluctuating, just as in cases of ovarian dropsy. M. Rayer correctly criticises these directions. It is obvious that as hydronephrosis of one kidney is compatible with perfect exercise of the functions, the proceeding should not, under the supposition of the disease being simple, be put in force, more especially as the puncture has been known to induce fatal peritonitis. M. Rayer goes on to say, that the case is different if evidences of inflammation be perceptible in the tumour, with the possible tendency to softening and perforation of its walls ; but the case, M. Rayer appears to forget, is then one of pyelitis, so that he would not admit the operation in a true case of hydronephrosis at all,— and in this he appears to have experience and reason on his side.

Cysts of the kidney. These are divided by M. Rayer into *simple, acephalocyst,* and *urinary.* Although containing matters of considerable interest, we shall not for the present undertake the analysis of this chapter.

Diseases of the blood-vessels. We pass to the diseases of the *renal arteries ;* they appear to be neither numerous nor frequent. In the kidney of an old man M. Rayer found the renal artery of very large size, and presenting transverse deep furrows on its internal surface. The kidney fed by this artery was a sixth heavier than its fellow ; however, as has already been hinted, no accurate ratio prevails between the size of the kidney and of its artery. The arteries are sometimes the seat of cartilaginiform and ossiform deposit ; and M. Rayer has collected from different authors three very satisfactory cases of aneurism of these vessels.

The *emulgent veins* are the frequent subjects of congenital anomalies ; it is unnecessary to refer particularly to their varieties. These vessels are not very commonly affected with inflammation, which exhibits itself in all its forms and degrees, from the formation of fibrinous coagula upwards. Renal phlebitis may coexist with inflammation, or some other affection of the kidneys ; in other cases it is consecutive to inflammation of the vena cava, or ovarian vein. This connexion of the inflammation

of the renal and ovarian veins was, we believe, first pointed out by that very indefatigable inquirer, Dr. Robert Lee.

The renal plexus, and the nerves distributed to the kidneys, may increase in volume in cases of hypertrophy of those organs; M. Rayer has figured an example of the fact.   Whether they undergo diminution of size, in cases of atrophy, he is unable, from his own experience, to affirm. Nor can he throw any light on the interesting question, whether the nerves of the kidney may be the seat of neuralgia, independently of other affections, or of lesions of the neighbouring organs.   No doubt the pain is not truly neuralgic in nephritic colic, but depends upon distension of the fibrous tissue of the ureter, more or less excoriated on its inner surface by the passage of a rough mass.   Hysterical women sometimes complain of a pain in one or both renal regions, which has been duly described as neuralgia; but this M. Rayer is inclined to regard more as an affection of the spinal marrow, and of the lumbar nerves, than of the renal plexus. Aneurisms of the aorta sometimes occasion pain in the renal region, sufficiently intense to simulate an affection of the kidneys.   The term nephralgia is, nevertheless, in spite of the want of precise knowledge of the subject, freely and boldly used by nosological writers.   The whole subject stands in need of serious investigation.

HOMOLOGOUS FORMATIONS.   M. Rayer next proceeds to the description of what he terms "homologous tissues," developed in, or in connexion with, the kidneys.   The first of these considered is the cellulo-fibrous.   The glands and ducts in the cortical substance are sometimes converted into a fibrous tissue of bluish white colour,—a condition, in some cases, the result of chronic inflammation, and in others of a lesion of the ducts of Bellini.

There are occasionally observable in the cortical substance, and more frequently in the tubular, certain whitish granules, of cartilaginous aspect and consistence; cartilaginous patches are sometimes found in the fibrous capsule.

The capsule may become ossified, present partial saline deposits, or assume altogether the appearance of a bony shell, resembling that sometimes formed by the pericardium round the heart.   In rare cases the kidneys are the seat of " osteides;" that is, of masses composed fundamentally of fibrous tissue traversed by blood-vessels, and containing calcareous matter from place to place.   These osteides are, according to M. Rayer, perfectly analogous to fibrous tumours of the uterus, and cannot be divided except with the saw.   For some further descriptions of ossific deposit in the kidney we must refer our readers to the original volume.

The development of erectile tissue in the kidney is so rare, that M. Rayer has met with two examples only of it; in both instances the liver was affected with the same species of change.   The erectile tissue appeared to consist of several small loculi, with veins ramifying between them [?]; no trace of scirrhus or encephaloid was to be discovered.   Baillie and Lobstein appear also, from references made by M. Rayer, to have met with this kind of formation in the kidney.

FATTY KIDNEY.   M. Rayer makes a very just division of the cases which have been described as examples of fatty degeneration of the kidney into two classes: one of these, characterized, according to this ob-

server, by true fatty transformation of the organs, is very rare; the other, in which the morbid state consists of accumulation of fat round the organ which itself undergoes atrophy, is much more frequent. The kidney may besides become fatty in the same manner as the liver; Pascal has described a case in which the organ yielded a multitude of drops of oil under pressure. The following case, observed by M. Bricheteau, is interesting: A woman, aged forty-five, remarkably fat, was admitted under that physician at the Necker Hospital, with a series of symptoms, leading to the diagnosis of pneumonia. She had not passed any urine, according to her own account, for fifteen days; she was catheterised on three successive days, intervening between her admission and death, without a single drop of urine being found in the bladder. The kidneys appeared plunged in the midst of an immense quantity of fat; they retained their form and natural bulk, but were transformed into two masses of compact fat, in which some vestiges of tubular substance were traceable. The pelves, ureters, and bladder seemed healthy; the latter contained no urine.

HETEROLOGOUS FORMATIONS. The kidney is far from a very unfrequent depository of these; they occur here in every variety observed in other organs. In the description of them, M. Rayer gives evidence of his usual profound acquaintance with the subject of renal disease.

Tuberculous disease. Tubercles may occur in every one of the renal tissues; and sometimes, in consequence of acute or chronic inflammation of the surrounding substance they soften, the mass opens into the cavity of the renal pelvis, and the expulsion of the tuberculous matter may be followed by the formation of real cavities and fistulæ.

In the cortical substance the morbid matter is often deposited in small disseminated grains, of the size of a millet seed or less. These grains are commonly not permanent on the surface of the organ, nor adherent to its external membrane. They are distinguishable from the small pustular collections of pus occurring in some forms of nephritis by the absence of the narrow red circle which usually surrounds the latter. Tuberculous matter also occurs in the cortical substance in small compact masses of the size of a nut or an olive, smooth, of slightly yellow-white colour, and having altogether the appearance on section of a horse-chesnut. These masses are liable to soften; they are sometimes in immediate contact with the tissue of the kidney, in other instances separated from it by a very thin membrane, resembling the adventitious membrane found inclosing certain large abscesses of the liver.

As respects the tubular substance, the tuberculous matter may be deposited in it in grains, in masses, or as a sort of powder infiltrated in the substance of the mammillæ. These eminences may be destroyed by true tuberculous ulceration.

The condition of the renal tissue surrounding tuberculous matter varies. Though suffering pressure the tissue may have the appearance of perfect health, or it may be discoloured; when the kidneys contain a great abundance of tubercles, the intervening tissue appears injected, red with imbibed blood, and in cases of tuberculous nephritis, small collections of pus are found between the crude or softened tubercles.

In some cases of tuberculous deposition, the size of the kidneys appears manifestly increased; their bulk is rarely diminished. It has been said that both organs are generally attacked; of sixteen cases, however, ob-

served by M. Rayer, six only were examples of double tuberculization; in seven of the ten remaining cases, the left organ suffered. When the kidneys are tuberculous, not only are the lungs almost invariably so, but also other parts of the genito-urinary system, the liver, the mesenteric glands, the intestines, &c.

The diagnosis of tuberculous disease of the kidneys is, it appears, even to M. Rayer, a matter of extreme difficulty. However the difficulty is by no means the same in all cases : it is infinitely greatest when the new product is seated exclusively in the proper substance of the kidneys themselves, and does not extend to the excretory canals. There is in truth, according to this observer, no distinctive condition of the urine in such cases : nor are the kidneys, except in rarest instances, sufficiently enlarged from their tuberculous infiltration of their substance to cause appreciable tumour externally. Pain in the seat of the organs may be produced by inflammation occurring around the tuberculous deposits; but the kidneys may become painful in tuberculous subjects without a deposition of the morbid matter within them.

When the tuberculous matter seated in the mammillæ undergoes softening, it is often detached and mingles with the urine ; under these circumstances, or when the calices, pelvis, or ureters are infiltrated with this substance, the urine acquires certain characters which may announce the presence of tubercle in the urinary passages. At the moment of emission, it is more or less turbid, or at least it holds in suspension particles of organic non-fibrinous matter, which deposits with the salts of the fluid. Examined under the microscope, this sediment is found to be formed in great part of mucous globules and sometimes of blood-discs, together with an organic matter, which does not dissolve in dilute acids, as do the phosphates and urates. When this organic matter is closely scrutinised, it exhibits nothing but granules perfectly distinct from pus- and blood-globules. The quantity of this tuberculous matter, for such it is, varies extremely with different emissions, but never reaches the amount observed in the instance of purulent deposit. Another circumstance may occasionally occur to strengthen the diagnosis ; the tuberculous matter sometimes accumulates in the upper part of the excretory passages, so as to cause obstruction to the escape of the urine, and so produce distension of the pelvis and calices with tumour appreciable by application of the hand and by percussion. Further, observation has frequently demonstrated the coexistence of tuberculization in the vertebræ and kidneys ; the existence of tuberculous caries of the lower dorsal or upper lumbar vertebræ, *accompanied with changes in the constitution of the urine,* (provided neither paralysis nor retention of urine are present,) renders the existence of renal tubercles very probable.

The observations of M. Rayer have taught him that inflammation exercises no influence upon the development of tubercles in subjects who are not predisposed to this species of disease. Nay more, " the frequency of renal inflammation on the one hand, and the rarity of tubercles of the kidneys on the other, prove that it is doubtful, in the majority of cases at least, whether a local irritation [even in predisposed persons] has been the immediate cause of the tuberculous deposition."

It is useless to speak of the prognosis of tuberculous disease of the kidney, where it is a mere part of general tuberculization. When the

disease affects the kidneys only, (a condition which must be, at the least, singularly rare,) the prognosis is less serious, and some advantage may, according to M. Rayer, be hoped from the use of an extremely strengthening diet, generous wine and preparations of iron, while the inflammatory symptoms are controlled by the frequent employment of gelatine baths.

CANCER OF THE KIDNEYS. This is a morbid state, which presents itself in different forms and degrees in these organs. Children appear to be rarely subjects of it ; it is sometimes seen in adults ; it is more common in advanced age. M. Rayer's own experience would lead him to consider the disease more common in males than females, an opposition to the general distribution of cancer in the two sexes, referrible no doubt to the causes of the greater frequency of all renal maladies in males.

Cancerous disease may be limited to the kidneys, or, as is much more common, it coexists with cancer in various other organs. In some instances it has appeared to M. Rayer that cancer of the kidney has originated under the influence of cancer of a neighbouring organ ; thus he would explain the frequency of small cancerous masses in the right organ when the liver contains medullary sarcoma, and also " the well-established relations of cancer of the left kidney, with carcinomatous degeneration of the descending colon and fundus of the stomach."

Encephaloid cancer is the most common form of the disease in the kidney ; fungus hæmatodes comes next in point of frequency, while it is yet more rare to detect true scirrhus of this organ. The disease almost always originates in the cortical substance, but it may extend to the tubular portion secondarily. The membranes of the kidney, the walls of the pelvis, and the blood coagulated in the renal veins may participate in the affection.

When the cancerous substance occurs in small masses few in number, the dimensions of the kidney are not manifestly increased ; under other circumstances, the organ is capable of acquiring monstrous bulk, the surface then becomes irregularly tuberculated, with masses protruding to a considerable height in some instances.

M. Rayer has only found tubercle and cancer associated in the kidney in a very small number of cases ; he has " more frequently seen tubercles in the lungs and encephaloid matter in the kidneys of the same individual." The author's experience upon this latter point appears to be at variance with the following statements of Dr. Walshe : " Tubercles and cancer rarely coexist. In fifty-two autopsies of cancerous subjects collected from various sources we found but three examples of the anatomical characters of phthisis. The difference of the ages at which the two diseases are most prevalent would lead us to expect a result of this kind, independently of any influence which the formation of one may have in excluding that of the other form of morbid matter."* We have recently heard that Professor Rokitansky, of Vienna, has expressed an opinion similar to that inculcated by Dr. Walshe. The point is an extremely interesting one, having obviously an important bearing with reference to the laws regulating diseased developments in general.

Cancer of the kidney may be almost completely, if not altogether, latent ; that is, it may not have attained sufficient bulk to produce ex-

* Cyclopædia of Surgery, Art. Cancer, p. 623.

ternal tumour; it may not cause hematuria, and any pain to which it may give rise may be of a kind far from characteristic; indeed there is no species of renal pain essentially different from that caused by certain special diseases, by aneurism of the aorta, &c. The signification in which, we infer from this, M. Rayer uses the term latent, appears to us vague and indeed inaccurate; but we cannot stop to argue the point.   After a certain period has elapsed, the kidney enlarges sufficiently to form an appreciable tumour, variable in size and commonly presenting, as we have seen, irregular protuberances on its surface.   Hematuria also sets in and recurs irregularly, being occasionally interrupted, among other causes, by the obstruction of coagula in the ureter.   The urine is turbid; the colour deep; the odour fetid.   Retraction of the testicle, which so frequently occurs in cases of pyelitis with obstruction of the urine, is rarely met with in cancer.

The general symptoms of the disease are those characteristic of carcinoma generally.   Of its causes nothing appears to be distinctly known; the various maladies of the urinary organs, and especially their inflammations, have no manifest influence on its production.

The occurrence of hematuria in a subject who has laboured under pain in the renal region, and who has not passed gravel nor suffered from complete or incomplete retention of urine, is of some importance in respect of the diagnosis of the disease.   Without hematuria to guide us, it is indeed often impossible to ascertain the real seat of cancerous disease in the kidney, when sufficiently extensive to produce considerable tumour.

True *melanosis* of the kidney has only been observed by M. Rayer in cases of the melanic diathesis, when formations of the same kind existed in considerable number in the skin or in the subcutaneous cellular tissue, the lungs, or other organs; and even under these circumstances there were but slight traces of melanosis in the kidney.   Symptomatically considered the disease is unimportant, and M. Rayer furnishes no information of novel character respecting the anatomical peculiarities of the disease.

ENTOZOA IN THE KIDNEYS.   The chapter on the entozoa found in the kidneys commences by some very just observations upon the general inaccuracy and unsatisfactory character of the statements of older authors on the subject of worms voided through the urinary passages.   The entozoa, which are indubitably forced in the kidneys in certain cases, are the acephalocyst, the strongylus gigas, the spiroptera hominis, and the dactylius aculeatus.

The strongylus is distinguished by its cylindrical elastic body attenuated at both extremities, generally several inches long in the human subject, and of a blood-red colour when alive; this colour is discharged by keeping the animal in water or alcohol.   These worms bear some resemblance in form and size to lumbrici, and have, it would appear, been mistaken for them.   Of the rarity of the strongylus, a sufficient proof (in addition to common experience) is furnished by the fact that M. Rayer has examined more than 3000 human kidneys and more than 500 kidneys in the dog without finding a single one.   The symptoms determined by the presence of strongyli in the kidneys are extremely like those produced by renal calculi, namely, pain in the kidneys, frequently

hematuria, occasionally retention of urine in the pelvis and calices, and as a result of this the development of a tumour in the lumbar region. Tumours of this kind may burst spontaneously, externally, or be opened (as has been done) by the surgeon. During life the existence of strongyli in the kidneys cannot be demonstrated unless by the expulsion of one or more of these worms; for as we have first seen, the symptoms they determine are simply those of pyelitis with retention. Nothing is known respecting remedies capable of determining the expulsion of strongyli during life; their rare occurrence sufficiently explains this deficiency of knowledge.

The spiroptera is an entozoon found occasionally between the coats of the stomach in mammalia, and especially in birds; there appears to be but one case on record in which individuals of this species were voided with the urine. We allude to the case reported by Mr. Lawrence in the second volume of the Medico-Chirurgical Transactions; Bremser and Rudolphi having both expressed their opinion that the worms voided in this case were spiropteræ; M. Rayer transcribes the narrative, but has no additional information to afford. His account of the dactylius aculeatus is copied from Mr. Curling's paper on the subject.

MALFORMATIONS OF THE KIDNEYS. We proceed to notice briefly M. Rayer's observations on these. Numerous are the cases of three kidneys in the human subject described by authors; nor are examples of the existence of four of these organs wanting. The only point of physiological interest connected with this superabundance of kidney is that no evidence exists of its ever being attended with unnaturally great secretion of urine.

The total absence of kidneys has been several times noticed in the fœtus, occasionally in the infant at birth, and one case is recorded of such absence in a young girl. This last almost incredible history is related by M. Moulon, physician to the Trieste Hospital, of a person aged fourteen, who died of chronic enteritis; among other malformations, there were neither ureters nor kidneys to be found; but the caliber of the umbilical vein greatly exceeded that usual in adults. The girl had from her birth been subject to an inconvenience of very troublesome character; there flowed continually from the umbilicus a fluid closely resembling urine, and emitting so strong a smell that it was impossible to change the linen covering the part sufficiently often. The observer of the case supposes that the anatomical conditions now noticed (the bladder was also wanting) justify the idea that the blood freed itself in the liver from the principles entering into the composition of the urine, and that these were conveyed by the umbilical vein to the umbilicus, whence they were finally excreted. If, observes M. Rayer, the case related by M. Moulon were accurately reported, it would render less incomprehensible than they now are certain cases of anuria on record, one for example described by M. Vieuisseux, of Geneva, in which total suppression of urine existed for seventeen months, at the close of which period the discharge returned, without the patient having suffered from any alarming symptoms. But M. Rayer is inclined to believe that M. Moulon's patient was really affected with extrophia vesicæ, and that the kidneys, "peut-être déplacés," were not looked for with sufficient care. This " peut-être déplacés" is really too bad; as if it is possible to conceive that a man holding the po-

sition of physician to a large hospital in an important city could be so flagrantly ignorant, especially when all his senses must have been alive to the extraordinary nature of the case, as not to know the kidneys, if they had been in their natural place. Really the *chances*, to say the least, are against M. Rayer.

Numerous authentic cases are to be found of absence of one kidney. The remaining organ has generally been found larger than natural, and sometimes of double its natural weight. It is either found in its natural place, or a little higher or lower; where a single kidney has been described as seated crosswise on the spine, there, no doubt, existed two kidneys fused, as it were, into one. There is a very curious example of "like master, like man," given by M. Rayer under this head: Cabrole opened the body of a professor at Montpellier and found but one kidney; one of the servants of this gentleman was subsequently found likewise to possess but a single kidney, or at least apparently but one, his case being, according to a conjecture of M. Rayer, probably an example of fusion of the two organs into one.

The kidneys are the occasional subjects of anomalies of situation, either permanent or non-permanent. When they are fixed permanently in an abnormal situation, this state may have been congenital or accidental; the subject is generally tolerably well understood, and we shall not dwell upon it here. Non-permanent displacement or mobility of the kidney is a state less known, and possessing much more practical pathological interest; we shall, therefore, give our readers the benefit of M. Rayer's observations upon it. Mobility of the kidneys is that condition which allows of their changing their position downwards or forwards, or of their being pushed upwards under the liver or backwards, and is the cause of various symptoms; for example, habitual pain in the abdomen and corresponding lower extremity, pain which has been mistaken for nervous colic, hypochondrical pain or lumbar sciatic neuralgia. This condition of the kidney is far more frequent than is commonly imagined; is met with almost exclusively on the right side, and occurs more frequently in females than males. In the majority of cases there is coexistent with it enlargement of the liver, with displacement of the intestine or uterus; it may also be a result of a particular arrangement of the peritoneum, of a deviation of the kidney, or of a flexuous state of its vessels, &c. Frequent pregnancy, laborious efforts to raise heavy loads, &c. have in some cases appeared to be its immediate cause, in other instances no direct cause has been discovered.

The most common symptoms of this state of the kidney are pain in the right lumbar region, sometimes extending in the direction of the lumbar and crural nerves, with an habitual sensation of weakness and discomfort in the abdomen. The pain sometimes ceases, and may then be excited by pressing the kidney with the fingers of the right hand, while the left supports the loins behind. Peritonitis sometimes complicates the case, probably induced by the traction exercised on the peritoneum by the displaced organ. Patients sometimes discover the tumour themselves, and naturally feel much apprehension as to its character. Of two medical men thus affected, and in whom M. Rayer was the first to detect the true nature of the case, one had left the profession altogether from the dread of having serious organic disease.

Experience has proved to M. Rayer that in general all that needs to be done in these cases is to support the abdomen with a belt, which either removes the pain altogether or at least renders it very bearable. In two cases where this renal displacement coexisted with procidentia of the uterus, great benefit was derived from constantly observing the recumbent posture and the use of sulphurous *douches.* When the pain is very acute, and there are signs of either peritonitis or enteritis, local bleeding and emollient applications should be employed. All violent exercises, dancing, riding, leaping, &c. are of course to be avoided; and constipation carefully guarded against.

With this brief notice of a very curious and practically interesting condition of the kidney, (of which we had the opportunity, during a recent visit to Paris, of observing an example, in M. Rayer's wards,) we for the present take leave of this laborious and estimable writer, with the hope that the appearance of his fourth and concluding volume will soon enable us to introduce him once again to the notice of our readers.

Art. XVI.

Treatment of the Diseases of the Eye, by means of Prussic Acid Vapour, and other Medicinal Agents. By A. Turnbull, m.d.—*London,* 1843. Small 8vo, pp. 89.

The author of the small work before us has, for several years past, been made known to the public and the profession, through the medium of his own writings and the writings of his friends, in pamphlets, journals, and newspapers, as one of the most distinguished members of that gifted and benevolent brotherhood whose delight and glory it is to redeem the lost dignity of physic, by curing the incurable. We take shame to ourselves that we have so long deferred to give, in our pages, a more permanent record of his merits,—a fault for which we shall now, in our humble way, make amends, by inscribing the name of Turnbull on our scroll of immortals, already resplendent with those of Curtis, Yearsley, Dickson, &c. As opportunity offers, we shall hope to heighten the glories of this galaxy of medical miracle-workers, by adding those stars of rival magnitude—the Cronins, Courtenays, Gosses, Ramadges, Van Butchels, &c. &c., which have been so long shedding benignantly their "bright effluence" on a suffering public and a benighted profession.

Like the great Curtis, Dr. Turnbull has built his fame on the double basis of the Eye and Ear; and like him also, and like another man of kindred genius, William Shakspeare, he has

"Exhausted worlds, and then imagined new."

It is, doubtless, known to all our readers, that, two or three years since, Dr. Turnbull, having restored the hearing of the few deaf persons still left in England after the labours of Curtis and Yearsley, betook himself to Scotland, and, in a single tour in a single season, annihilated deafness as a disease, in that extensive and populous country. The history of this triumphant " Progress" of the great Ear-doctor, and the immediate results of his treatment, are recorded in Chambers's Edinburgh Journal; and the final results were made known at a subsequent period, by Mr.

Kinniburgh, the excellent and intelligent Head Master of the Institution for the Deaf and Dumb in Edinburgh.

From the work before us it would seem that Dr. Turnbull has now set about doing that for the Eye in England, which he did for the Ear in Scotland ; and in the present notice we shall endeavour to do for him in the south, what Mr. Chambers did for him in the north,—viz., blazon his miracles in their very dawn ; not doubting that some London Kinniburgh will hereafter do himself the honour to lay them before the public in their meridian glory—their complete development, and final effects.

Although the number of the miraculous cures recorded in this book is not great,—the author having only been able to " appropriate a few spare minutes to its preparation, amid the multiplicity of professional duties,"— we presume that Dr. Turnbull has nearly exhausted the stock of blindness in London, as we perceive from an advertisement appended to his work, that he is already turning his disinterested look " to fresh fields, and pastures new."

" *Preparing for publication,* — Suggestions for an improved treatment of the diseases of the Heart and Lungs."

Improved Treatment!   Diseases of the Heart and Lungs! Good heavens! this must surely be a mistake.   Where has he met with such diseases ? What will Dr. Ramadge say to his illustrious brother, for even hinting to the world that there *can* be an " improved treatment," or even that any such " curable" diseases yet remain to be cured ?   For our own parts, we have not seen any case of the kind since the week after the last edition of Dr. Ramadge's book was published ; and we are told that Mr. Farr has, in his recent Report, omitted the very title of such affections from his list of mortal diseases.

Dr. Turnbull being an illustrious member of that class of great men, of one of whom it was long ago said,

" None but himself can be his parallel ;"

and as we sincerely believe that his deserts are of that exalted sort,

" That those who paint them truest praise them most ;"

we shall, on the present occasion, do nothing more than we recently did in the analogous case of the great Dr. Dickson, viz., give a simple abstract of the singular doctrines, and still more singular facts, which are recorded in the volume on our table.   We are sure that on perusing this abstract, our readers will be of opinion that all comment is unnecessary, as the said doctrines and facts must, in their minds, " plead, like angels, trumpettongued," in behalf of the instantaneous installation of Dr. Turnbull into the illustrious band above commemorated, who, with him, are patiently working for, and calmly awaiting, that Apotheosis which is now enjoyed by their great precursors—the Cagliostros and Katterfeltos of the last age, and the St. John Longs and Morrisons whose mundane glories we ourselves have had the privilege to witness.

We may, first of all, direct our readers' attention to some of Dr. Turnbull's theories, which, to say the least of them, are original.   One of them meets us at the very threshold.   " It is a well-known fact," says Dr. T., " that the eyes of those who have been destroyed by hydrocyanic

acid show none of the usual symptoms of dimness for a length of time
after death. On the contrary, the eye is clear, and the pupil much
dilated." This we believe to be true, and generally known; but is it
possible to conceive anything more original and ingenious than the con-
clusion Dr. T. draws from the glistening, staring expression of the eyes
of one poisoned by prussic acid? "This satisfied me," he says, "that
the acid exerted a specific action upon the eye, which might be made
available as a medical agent for relieving many of the diseases to which
that organ is so subject." (p. 4.) Now, as it happens that those who
die from the influence of carbonic acid, and those who expire in a fit of
epilepsy, present the same appearance of the eyes as that described by
Dr. T., surely it ought not to expose one to be considered a follower of
Thessalus to conclude, in the same analogical mode of reasoning, that a
brazier of charcoal, not pushed too far, or a gentle epileptic fit, might
cure a cataract or an amaurosis. Good observations are undoubtedly
the basis of all our reasoning, but it is plain that even the most striking
facts may remain unapplied, till they are seen by the eyes of genius.
"Take, thou, my eyes, and see!" said Nicomachus; and so may exclaim
Dr. Turnbull, on the present occasion.

The following is another specimen of Dr. Turnbull's original mode of
theorizing. Speaking of bisulphuret of carbon, and chlorocyanic acid,
he says, "the action of these medicines, which contain so large a share
of carbon, arises from the carbon in the vapour permeating the cuticle,
and coming in contact with the oxygen in the vessels." (p. 12.) The
same theory is again referred to, when treating of the utility of oily em-
brocations, applied to the forehead. "The rationale, in my opinion,"
says Dr. T., "is, that the large quantity of carbon in some of the essen-
tial oils, and its solubility in alcohol, permits it, by the friction, to pass
through the cuticle and unite with the oxygen." (p. 71.) At first
glance we felt rather disposed to quarrel with Dr. Turnbull, for intro-
ducing so commonplace a topic as the cure of amaurosis by stimulating
embrocations, but a moment's reflection on the lucid and most satisfac-
tory theory of their *modus operandi*, as well as that of the bisulphuret of
carbon and the chlorocyanic acid, made us change our views. The effect
of stimulating liniments was formerly attributed to their action on the
nerves of the skin, but how much more satisfactory is Dr. T.'s explana-
tion! It is the carbon, permeating the cuticle, and uniting with the
oxygen in the blood, which, by "forming carbonic acid, evolves heat in
the ratio of the quantity consumed by the oxygen (p. 12), and cures the
disease. We are only sorry that Dr. T. has nowhere given us the proofs
that the bisulphuret of carbon, and the other substances he mentions, are
decomposed by being brought into contact with the cuticle. This is,
however, a trivial omission, and, no doubt, to be ascribed to the hurry
into which the author has lately been thrown by his "multiplicity of pro-
fessional duties." What would he say, to extending his theory of those
carbon-containing substances a little farther? As the eyes of those who
have been destroyed by carbonic acid show none of the usual symptoms
of dimness for a length of time after death, may not substances which
yield carbon to the oxygen in the vessels, when applied to the cuticle or
to the conjunctiva, exert a specific action upon the eye? He has been
so successful as to prussic acid, that we are tempted to submit this hint

to his better judgment, as a further extension of the principle of which he is undoubtedly the original discoverer.

As another example of Dr. Turnbull's wonderful therapeutical science, we may quote what he says regarding the action of the vapour of concentrated prussic acid on the eye. He tells us, that he puts into an ounce phial a drachm of the acid, and holds it in close contact with the eye, the eyelid being open, for the space of about half a minute, or until the patient feels a little warmth, or the person holding the phial sees the pupil greatly dilated, and the vessels of the eye injected with blood. "The patient," says he, "is not sensible of pain from this peculiar state being induced, which appears to me to result from the powerfully sedative influence of the acid, thereby showing that two opposite powers—to wit, the stimulating and the sedative—are exerted at the same time; and thereby the uneasiness arising generally from a stimulant alone is prevented. Its greatest power in removing these diseases chiefly arises from the two powers being so blended, and thus enabling the eye to bear a sufficient stimulating action without injury." Who shall dare to deny, that the discovery of this double working of the vapour, stimulating and depressing, blowing hot and cold, not merely with the same breath, but at the same instant, is perfectly original and highly ingenious? To object to the author's statement, that it will be difficult for the bottle-holder to see the pupil dilating through the phial, or to hint that the equality of the two forces will be apt to render both of them null, would only show the objector's ignorance, and display the envy and malignity of spirit with which all new and wonderful discoveries are apt to be received.

We must now turn to Dr. Turnbull's statements regarding the practical results arising from the use of the medicinal agents he recommends. To begin with those which deviate least from ordinary practice: Dr. Turnbull cures amaurosis by stimulating embrocations applied to the forehead and temples. The stimulants he employs are chiefly the essential oils of cloves and pimento. But to show how impossible it is for a mind of genius to take up even the most ordinary matter without irradiating it with some new idea, Dr. Turnbull recommends those oily liniments to be sometimes, for a change, mixed with magnesia, made into pills, and administered internally. To balance accounts, castor oil, which is generally swallowed as a purgative, Dr. T. drops into the eye, with astonishing effect, in removing specks of the cornea, and otherwise purging the visual orb.

Dr. Turnbull's grand remedy, however, is the vapour of concentrated prussic acid. He favours us with fourteen cases, illustrating its effects in specks of the cornea, staphyloma, atrophy of the eye, inversion of the eyelashes, conical cornea, amaurosis, and cataract.

The *first case* is one of opaque corneæ, from variolous ophthalmia. The left eye was very much diminished in size, and the cornea studded with white spots. The right cornea was so opaque that neither iris nor pupil was to be seen. After four months' use of the vapour, the left eye had got tolerably clear, and the right was becoming transparent. The only remark a critic could make on this case respects the statement that the right eye will soon be the better eye of the two. The thoughtless reader may fancy that it was so from the commencement of the treatment, as the left eye was atrophic; but surely Dr. Turnbull and his patient know best.

The *second case* is one of disorganization of the eyes from inflammation, probably scrofulous. Dr. T. found all the humours of the left eye lost, a state of matters which, we believe, yields only to the prussic acid vapour. The right eye was much diminished in size, and the cornea very opaque. Under the use of the vapour, for a month, the chambers of the left eye became filled, to the extent of half the size of a healthy eye. The right cornea became almost transparent, and the sight almost perfect. Now we know perfectly the remark which the enemies of Dr. T. will make on this case. The age of the patient being thirteen, they will tell us that this is a period of life when the effects of scrofulous ophthalmia are apt suddenly to disappear. In reply, the doctor has only to ask them, when they saw any natural cure of this sort accomplished, where the humours were entirely lost, aqueous, crystalline, and vitreous, and the eyeball reduced to a mere stump, formed of its shrunk tunics? No! no! restoration, under such circumstances, can be effected only by the vapour of Russell Square.

The *third case* is one of staphyloma of the left eye, with such opacity of the right cornea that no appearance of iris or pupil could be discovered. Under the use of the vapour, the cornea of the right eye became transparent, and the opacity of the left was " so far removed as to give evidence that a continuance of the medicine will render it again perfect." Now, this statement some snarlers will perhaps be for rejecting as untrue. They will deny the possibility of an eye becoming perfect, in which the iris is united to an opaque and projecting cornea, or rather an opaque and projecting cicatrice occupying the place of the cornea, and that either by natural or by artificial means : they will tell us that the iris can never be separated, so as to allow the pupil again to appear; that the opaque cicatrice can never become transparent; and that consequently vision can never be recovered. Against all such assertions and aspersions Dr. T. will, no doubt, stand unmoved.

The subject of the *fourth case*, a girl of fifteen, was affected with opacity of the left cornea, and atrophy of the right eye. She was perfectly blind. Under the vapour, the left cornea became so clear that the patient walked alone.

The subject of the *fifth case*, a man, becomes blind, to use Dr. T.'s phrase, from ophthalmia ; or, in other words, the corneæ become opaque, and the eyes are intolerant of light. Being blind does not mean, in Dr. T.'s language, that the retinæ are insensible, but only that the person cannot use his eyes to any purpose. All the applications used at the Eye Institutions where this patient attended, were of no use; such as black ointment, leeches, issues, steel internally, cupping, aperients, &c. Dr. T. applies merely two drops of warm almond oil to each eye. The man feels as if in another world, the intolerance is so much relieved. Castor oil is next used to the eye, to remove the opacities, and the cure is finished by the vapour.

The *sixth case* is one of choroid staphyloma of the left eye, and opacity of the right cornea, from ophthalmia neonatorum. Castor oil, and oil of almonds, diminish the size of the eyes; and the opacity of the right cornea is lessened by the same means. As the opacity clears, the pupil becomes visible, and an anterior capsular cataract is discernible. These effects of castor oil, and almond oil, are fully as wonderful as any of those

of prussic acid and vapour, related by Dr. T. Prussic acid vapour, which, in case second, was used to make the eye grow, is now employed to make the eyes little, and the left eye diminishes to about half its former size. Light becomes visible to it, and the right cornea becomes transparent.

The *seventh case* is one of staphyloma of both eyes. The right had been operated on five times at an Ophthalmic Institution, but what kinds of operation had been performed, Dr. T does not say. Both eyes were perfectly opaque, studded with blue spots, having no appearance of iris or pupil, and stood prominently out beyond the lids. In the space of a fortnight, each eye became greatly diminished, and, as the opacity cleared off, a large triangular pupil made its appearance at the bottom of the right iris, enabling the patient to see. It is to be regretted that the treatment is not given, so that it is uncertain whether this artificial pupil was the effect of castor oil or the prussic acid vapour.

The *eighth case* is one of trichiasis and opaque corneæ. At one of the Eye Institutions at which the patient had attended, the upper eyelid had been cut off. After what we have learned of the effects of the vapour in atrophy of the eye and staphyloma, it is but a trifle for it to make the eyelashes resume their natural direction. Whether the amputated eyelid grew again under the application of the vapour, the doctor does not inform us. Case sixth shows the utility of castor oil, and almond oil, in reducing the size of too big an eye. Might we venture to inquire whether Dr. T. has tried *Macassar oil*, as a remedy likely to make little eyes to grow? or, at least to restore lost eyelids?

Case ninth is one of conical cornea, a disease which we have never known cured by any application, internal or external. It yields to Dr. T.'s application of castor oil to the eye, but still the sight is short, requiring the use of concave glasses. The vapour is employed, and the myopia is removed. As the number of short-sighted people in the world is pretty considerable, the vapour will no doubt soon have a fair trial. As it removes the myopia consequent to conical cornea, it will readily cure it where no such prominent change in the form of the eye has existed. Alas, for the spectacle-makers!

Case tenth is one of traumatic cataract of the right eye, with sympathetic inflammation of the left. Under the vapour, the cataract is half absorbed, and the amaurotic state of each retina yields, so as to allow the patient to read with the left eye, and to begin to see with the right. Dr. T. thinks, that unless the capsule of the lens had been lacerated in the accident which befel the right eye, the vapour could not have dissolved the cataract. But we here venture, with all deference, to differ from him. After the cures already related, there is nothing which may not be accomplished by the vapour. Extirpate the eyeball, apply the vapour, and to a certainty a new eye will begin to form, with which the patient will soon be able to read the smallest type. Should it threaten to grow too big, touch it with castor oil from time to time.

The *eleventh case* is another of traumatic cataract. The vapour is applied, and in three or four parts the cataract appears as if operated on by a couching needle. Here, again, the doctor's modesty overcomes him. " I am certain," says he, " it [the vapour] will not be a general remedy for lenticular cataract (unless employed in its incipient state), without operation, unless aided by rupturing the capsule of the lens by the needle

first;" which is, in English, that the vapour will not cure cataract without operation, unless with operation, a proposition which an ignorant, or ill-natured critic might pronounce to be nonsense.   But nobody knows better than Dr. T. what it is to cure a cataract without operation, with operation ; unless, perhaps, some of his patients.

Case twelfth is one of amaurosis of the right eye, with fixed pupil. The vapour makes the pupil act, but whether it makes it expand, as formerly stated at p 5, or contract, is not said.   Vision returns.

Case thirteenth is one of incomplete amaurosis of both eyes.   The right eye recovers, so that the patient can thread her needle.   Upon the pupil of the left eye the vapour had not the least effect, which leads Dr. T. to observe that " when prussic acid does not dilate the eye, in amaurosis, much good is not to be expected from its use.   In such cases," he adds, " I am inclined to believe that the disease is caused by pressure upon the optic nerve ;" thus overthrowing the dogma, that such pressure is the cause of dilatation of the pupil.

The *fourteenth case* is one of total blindness from birth.   The eyes were sunk in the orbits, and the pupils immoveable.   The doctor begins by making the eyes grow by castor oil.   A monthly increase takes place, and the pupils manifest a disposition to act. The vapour is then applied. The eyes assume a healthy appearance, and the patient begins to distinguish objects.

Such is an abstract of the *facts*, related in this work.   They have excited our wonder to the utmost.   It would be base to descend from the contemplation of the grand discoveries of Dr. T. to a criticism of his style, which is sometimes a little confused, a thing not to be thought surprising, considering the sort of hydrocyanic atmosphere in which his work must have been composed.

To the use of the vapour of concentrated prussic acid timid patients, it would appear from the doctor's own testimony, have objected.   How unlucky then is it, that substances of a less dangerous character answer nearly the same purpose !   We are afraid that almond oil, and castor oil, to say nothing of Macassar, will be fearfully abused in the cure of sore eyes, now that the doctor has unfolded their extraordinary virtues.

Art. XVII.

On Gravel, Calculus, and Gout ; chiefly an application of Professor Liebig's Physiology to the Prevention and Cure of these Diseases. By Henry Bence Jones, m.a., Licentiate of the College of Physicians, and Fellow of the Chemical Society.—*London*, 1842.   8vo, pp. 142.

That diseases resulting from obvious chemical changes in the composition of the animal fluids, should be, in some degree at least, amenable to treatment based upon chemical principles, is no new doctrine ; for not only is it one which would naturally suggest itself to the mind of any person acquainted with these principles, but it has been sufficiently confirmed by experience to give it a fair claim to attention.   It must not be forgotten, however, that our acquaintance with the ordinary changes of composition that occur in the processes of nutrition and secretion, is at

best of a very uncertain character; and, further, that we are as yet almost completely in the dark, as to the influence of the *vital* properties of the organism upon its chemical operations.   It seems to us that there is too great a tendency among the chemists of the present day, to regard the human body as a mere laboratory, into which certain quantities of material are introduced, certain effects produced, and certain results obtained.   We have seen a calculation of the amount of carbon expended in carrying a man to the top of Mount Blanc; by which it was demonstrated that the human machine does more work, with a less expenditure of fuel, than the best steam-engine that was ever constructed.   Really such notions are scarcely one whit less absurd than those of the Iatrochemists of the last century; indeed we very much question whether, in proportion to the prevalent intelligence of the age, and the advanced condition of physiological and chemical science, the modern absurdities are not the more glaring of the two.

Far be it from us to discourage inquiries conducted in a truly philosophical spirit; let the physiologist learn from the chemist all the facts which can throw light upon the obscurities of his science; and let the chemist push his inquiries to the utmost extent of which his objects and appliances are capable.   But let not the physiologist forget, that the chemistry of the body is but a part, and a very small part, of its vital action; and let not the chemist be too ready to assume as demonstrated facts, what are merely inferences, possessing a greater or less amount of probability, from data to which a considerable uncertainty is attached.

There are few novel doctrines which command an universal assent on their first announcement.   Even those which we now consider as almost self-evident axioms, have had to make their way through violent opposition.   And it is scarcely to be expected that those of a less positive character should at once prevail.   Indeed it would be very undesirable if it were so.   All ages have witnessed the evil of undiscerning submission to commanding authority; and in modern times, more particularly, we have seen abundant instances of the prevalence of brilliant error over sober truth.   The influence of great names does much; a specious aptitude or harmony on the part of the theory itself is also very effective; and when the two are combined, a very injurious result is likely to follow. But all are not so led away.   There are some who are bold enough to doubt, to question, or to impugn; and these laying hold of the errors of the system, are as indiscriminating in their censure as its admirers are in its praise, and attack the whole because they find a part to be untrue. It is well for the interests of science that such objectors should exist; for error would otherwise ride as a triumphant sovereign through the domain of which truth is the legitimate owner; and it marks the beautiful adjustment of the varying tendencies of the human mind, which none but an almighty Creator could have effected, that the contest, though often protracted and severe, is sure to be rightly decided at last.   *Magna est veritas, et prevalebit.*

The reception which Professor Liebig's recent work on Animal Chemistry has experienced, is an apt illustration of these tendencies.   By some it has been lauded as " perfect and entire, wanting nothing," a sort

of paragon, preeminent among scientific works for the accuracy of its data, the closeness of its reasoning, the comprehensiveness and originality of its principles. Everything which Liebig utters is to them law; nothing *can* be wrong, nothing even doubtful; the *ipse dixit* of the master is sufficient to establish every position; and his hypotheses are put forward as inductions, his probabilities as certainties. On the other hand, there are not wanting those who assert that his data are insecure, his reasoning frequently inconclusive, and his principles, in consequence, altogether unsound. We endeavoured, in our review of his work, to steer a middle course; satisfied that although errors might be discerned, there was much truth at the bottom; and we endeavoured, by a careful analysis, to separate the sound from the unsound parts, and to show wherein the value of the book truly lay. That our review pleased neither party, being too critical for the one, and too laudatory for the other, is a satisfactory evidence to our minds, that, whether correct or not in all its details, it was conceived and executed in a right spirit.

In the same spirit we have applied ourselves to the perusal of the work before us; in which an attempt is made to apply to pathology and therapeutics some of the physiological and chemical doctrines of Liebig, by one of his pupils and ardent admirers. The success of any such attempt must depend, in the first place, upon the truth of the doctrines themselves; and, in the second, upon the correctness of their application. To these questions, therefore, we shall now address ourselves, with, we trust we may say, a candid and inquiring spirit.

One of the most important disorders of the secreting function, is that in which an excess of lithic acid is present in the urine. This excess can only result from its presence in too large an amount, in the blood from which the product is separated; and it appears to be to the same increase, that the various phenomena of gout or arthritic inflammation are due. Hence we may regard the lithic acid diathesis as a constitutional state, characterized by an accumulation of lithic acid in the blood; and the separation of this substance through the kidneys, or its deposition in the tissues, may take place either conjointly or otherwise, according to certain peculiarities in the state of the system at the time. It is the object of the physician to prevent the undue production of lithic acid; or, to render it soluble, so that it may be excreted without difficulty. The production of lithic acid takes place, by the universal consent of physiologists and chemists, at the expense of the disintegrated albuminous or gelatinous tissues; which, having performed their appointed purpose, and lived their allotted term, undergo a change in their composition, and resolve themselves into different combinations of the same elements. For this change, the presence of oxygen is required, as it is for most of the decompositions to which the animal fabric is liable; and the requisite supply appears to be obtained through the respiratory process. Now uric or lithic acid is less highly oxygenized than urea; and it is the peculiar theory of Liebig, that the presence of an excess of lithic acid in the urine indicates a deficient oxygenation of the decomposing tissues; whilst increased oxygenation may occasion the complete conversion of uric acid into urea. He grounds this view in part upon the fact, that the urine of serpents and other reptiles, whose respiration is low, contains little or no

urea, but a large quantity of uric acid; whilst the urine of the carnivorous mammalia, which lead a life of great activity, inducing active respiration, is almost destitute of uric acid, but contains in its stead a larger quantity of the highly-oxidized urea.   It is a palpable objection to any argument of this kind, that birds, whose respiration surpasses that of any other vertebrata, void a large quantity of uric acid, and very little or no urea.   Of this objection, Liebig attempts to dispose by remarking, that birds take very little water; and that, as uric acid is very insoluble, it cannot be so readily acted on by the oxygen, as if it were completely dissolved in a fluid.   We cannot admit this explanation, however, until it shall have been shown, that the formation of urea is always preceded by that of uric acid; and that the greater or less oxidation of the latter is due simply to the mode in which it is diffused through the blood.   For our own parts, we should be much more disposed to believe that the *form*, whether of uric acid or urea, is determined at the moment at which the conversion of the organized tissue into these products of secretion takes place; and that the variation in the supply of oxygen, if it have any effect at all, must be exerted upon the uric acid whilst in a nascent state.   Hence we meet in birds with the anomaly of a high respiration and low oxygenation of the solid matter of the urine, a fact completely opposed to Liebig's hypothesis.

There is another objection of even greater weight, of which we do not remember that any notice has been taken by Liebig or his followers.   It is this : What proof can be given that *all* the azotized matter of the urine is derived from the disintegration of the animal tissues ?   We are informed by Liebig that it *is* so ; and he even goes so far as to state, that the amount of azotized matter in the urine may be regarded as a measure of the decomposition which takes place in the azotized tissues.   But, it may be asked, how is this to be substantiated ?   If we suppose that no more nutriment is received into the system than is requisite to supply its wants, we can readily admit that no azotized matter will pass into the urine, until after it has performed its part in the solid structure.   But if there be a surplus, either in consequence of an increase in the quantity of food, or a diminution in the demand, there would be an accumulation of nutrient materials in the blood, if means were not adopted to prevent it.   Among the lower animals we apprehend that such a superabundance will rarely occur.   Their natural instinct directs them to stop when they have had enough ; and though a delicious *morceau* may tempt to an occasional transgression, we believe that habitual overfeeding never occurs, except among individuals which have learned the bad habits of the human species, from being domesticated with it.   The gigantic boa gorges himself with an entire ox, and the gluttonous vulture distends its capacious stomach with the carrion of an almost entire carcase ; but these animals are in no hurry to renew their meals, and remain in a state of slothful inactivity, until aroused to energy by the calls of hunger.   Far different is the case with the lords of the creation.   The gratification of the palate, not the satisfaction of the natural appetite, is too often made the object of desire ; and instead of working off, by exercise and exposure, the ill effects of the repletion, a life of inactivity and indulgence is preferred.   A heavy reckoning is thus prepared for a sub-

sequent day; and who shall say that the punishment is not deserved? If a larger quantity of non-azotized matter is taken into the system than the liver and lungs can dispose of, it is deposited as fat. But what becomes of the azotized substances? They do not go to swell the bulk of the muscles. On the contrary, the nutrition of the muscular structure is augmented by the very cause that produces its disintegration. The effect of exercise in increasing the development of the muscular tissue is familiar to every one; and thus it serves, in two ways, to prevent the accumulation of azotized substances in the blood. But if high-feeding and inactive habits be combined, will Professor Liebig tell us how these substances are disposed of, except by passing,in an altered condition, into the urine? It is very possible that, in consequence of primary mal-assimilation (as Dr. Prout calls it), resulting from disordered state of the digestive organs, these matters *never could* have been appropriated by the tissues, and that they must hence either accumulate in the blood or be separated by a secreting process. But we cannot see how the simple excess of truly assimilable matter can be disposed of, except in a similar mode. We believe that the fibrin of the blood, like the solid tissues, has a limited term of existence *as such;* and that it must either be converted into solid tissue, or must undergo a change of composition. In the healthy state of the system, there is a constant demand for as much fibrin as the blood supplies, and there is consequently no waste; but if the supply is greater than the demand, how can the excess be removed, save through the excretory organs especially concerned in carrying off the superfluous and effete azotized matters of the system, namely, the kidney and the skin?

We have stated these objections, not in a carping spirit of detraction, but with the simple desire to arrive at the truth. We took occasion to point out, on af ormer occasion, (Vol. XIV, p. 514,) the exclusiveness of Liebig's views on the connexion of the biliary and pulmonary secretions, and their complete inapplicability to classes of animals formed on a plan different from that which he had considered; and it appears to us that he has fallen into a similar error in the present instance, from reasoning upon one particular state of the nutritive functions,—that which, unfortunately, is not of very frequent occurrence in man,—the exact conformity of the supply of food to the demand existing in the system. As will presently appear, we are not indisposed to admit the validity of Professor Liebig's hypothesis, as a *partial* explanation of the lithic acid diathesis; but we feel assured that many other causes may act, either concurrently or separately, in its production.

We are obliged to Dr. Golding Bird (Medical Gazette, Feb. 25, 1843,) for having directed attention to the important test of the validity of Liebig's theory, which is afforded by M. Edmund Becquerel's numerous analyses of the urine in various diseases. If this theory were correct, we ought to find that, in diseases in which there is deficient oxygenation of the tissues, the proportion of urea will be diminished, and that of uric acid will be increased; whilst in phthisis and in inflammatory diseases, in which, according to Liebig, there is an excessive action of oxygen on the tissues, the uric acid should almost or altogether disappear from the urine, being converted into urea. That this is far from being the case, the subjoined table will show.

DISEASE.	Quantity in 24 hours of		Proportion of Uric Acid to Urea.
	Uric Acid.	Urea.	
	Grains.	Grains.	
Healthy urine (general average)	8·1	255	1 : 30·37
Chlorosis, minimum of five cases	1·8	77·5	1 : 43
Chlorosis, maximum of five cases	6·0	172	1 : 29
Pulmonary emphysema with extreme dyspnœa...	4·9	172	1 : 35·1
Phthisis, tubercles softened	9·1	66·7	1 : 7·33
Phthisis, three days before death	9·8	29·4	1 : 3
Morbus cordis, with jaundice	9·82	73·3	1 : 7·6
Acute hepatitis, with jaundice	11·18	61·6	1 : 5·6
Jaundice	17·75	285·6	1 : 16·1
Milk-fever	19	133	1 : 7·47

In chlorosis, a disease marked by the deficiency of the red cor-puscles, and consequent lowness of oxygenation, we find that, whilst the whole amount of azotized matter in the urine was greatly diminished, the uric acid had undergone a special decrease; instead of being greatly increased, either absolutely, or at any rate proportionally to the urea, as Liebig's hypothesis would predicate. There is scarcely a better example of prolonged and distressing dyspnea, almost reducing the body to the imperfectly-oxygenated state of that of the reptile, than is afforded by a severe case of pulmonary emphysema. It might be expected in such a case, that there would be no oxygen to spare for the production of urea, but that the whole of the azotized matter would be thrown off in the state of urate of ammonia, as in reptiles. So far is this from being the case, that the quantity of uric acid is not only diminished to little more than one half its usual amount, but it is dimin-ished relatively to the urea present in the same urine. Again, in phthisis we observe that the whole azotized matter of the urine is very small in amount; and there would, therefore, be still greater reason to imagine that, by the excessive action of oxygen upon the tissues (which, we must observe, appears to us but a mere vague hypothesis,) even with a diminished respiration, the uric acid should all be converted into urea. But so far is this from being the case, that, with a decrease of the urea to about one fourth (in one case,) or one eighth (in the more advanced case,) of the natural amount, there is an actual increase in the quantity of uric acid; so that its proportion to the urea, instead of being diminished, is increased from 1 in 30·37, to 1 in 7·33, and even to 1 in 3. A corre-sponding increase is seen in various inflammatory diseases: and we fully agree with Dr. Golding Bird in the belief, that a theory cannot be true, which, when brought to the test of observation, affords results so entirely at variance with its predictions.

The theory of Liebig overlooks, also, several other causes of the ap-pearance of lithic acid deposits in the urine; each of which may act oc-casionally, either alone or in combination with others. Thus it is now generally admitted that the lithic acid, when held in solution, is in com-bination with ammonia or some other base; since any other acid which detaches that base from it, causes its precipitation. Now this may be accomplished by the formation of an organic acid in the system itself, as well as by artificially adding it as a precipitant. In certain forms of dys-pepsia, there is an excessive production of lactic and even of muriatic acid in the stomach; and with these conditions, we very commonly find united a lithic acid deposit in the urine. The acids generated in the stomach,

combine with the ammonia that would otherwise have held the lithic acid in solution; and the latter consequently falls as a gravelly sediment. The same effect may be produced by ingesting a mineral acid. An important therapeutic direction is hence indicated ; that, in the choice of articles of food, we should be careful to avoid those which are most liable to contribute to the generation of acids in the stomach. We need not inform our readers of the practical importance of this principle, when tried by the test of experience.

Any interruption to the secretory action of the skin, also, may produce a deposit of lithic acid ; and this perhaps, in various ways. The skin, besides discharging a large quantity of water, throws off no less than 100 grains of azotized matter daily, and its function is of great importance in the removal of such products. Now if perspiration be checked, there will be an additional amount to be thrown off by the kidneys ; and this may take the form of lithic acid. Again, checked perspiration will occasion an undue accumulation of lactic acid in the system; and this, combining with the ammonia, causes a separation and precipitation of lithic acid in the urine. Dr. Bence Jones suggests, in the treatise before us, another mode in which the accumulation of lactic acid may produce a lithic acid deposit; he regards, with Liebig, the lactic acid as one of the substances which is got rid of, in the form of carbonic acid and water, by the respiratory function, which introduces oxygen to carry it off. Hence he regards it as capable, by its superior affinity for oxygen, of preventing the operation of this oxygen upon the uric acid, by which it would be converted into urea. But this explanation rests upon the hypothesis, respecting the dependence of this change upon the amount of oxygen taken by respiration, which we have already examined and found insufficient. At any rate, we have other explanations of a more satisfactory character, to account for the well-known connexion between the lithic acid deposit and obstructed perspiration.

In regard to the metamorphosis of the albuminous tissues, Dr. Jones adheres to the theory of Liebig ; who attempted to show, as our readers will remember, that their constituents are at once resolvable into the essential constituents of the biliary and urinary excretions, namely, choleic acid and urate of ammonia. Dr. Jones endeavours to extend the same kind of reasoning to the gelatinous tissues. We are astonished to find him asserting (p. 12,) that the deposit of urate of soda in gouty concretions in the neighbourhood of the joints, *demonstrates* that the formation of uric acid takes place at the expense of the gelatinous tissues in which the deposits occur. In our humble judgment, this is no more demonstrated, than it is that the deposit of lithic acid in the urine proves that this acid results from the disintegration of the tissue of the kidney. Dr. Jones must be very ignorant of physiology, if he imagine that the deposit of a certain substance in any particular situation indicates anything else, than that the substance pre-existed in the blood, and that it is separated from it by some local action. Abundant proof of this is afforded by the operation of numerous remedial and poisonous agents. It appears to us that, following the plan which has been adopted by Dr. Jones in disposing of the elements of the gelatinous tissues, we need have no difficulty in theoretically metamorphosing any substance into any other. It is only to add or subtract a few atoms of oxygen, hydrogen, carbon, or nitrogen (which always seem to be most conveniently at hand for the

purpose,) to turn almost any organic substance into any other. Thus according to Dr. Jones, " the formula which Prof. Liebig gives, as corresponding most nearly to the analysis of gelatine is 32 c., 5 n., 27 h., 12 o.; deducting from this, one equivalent of urate of ammonia, 10 c., 5 n., 7 h., 6 o., there remains 22 c., 20 h., 6 o. But the formula for fat is 22 c., 20 h., 20 o. So that we may suppose that gelatine, by giving up four atoms of oxygen, might be converted into urate of ammonia and fat." (p. 14.) Another solution is afterwards given. " Gelatine, with the addition of four equivalents of water and two of oxygen, may be converted into fat, ammonia, urea, and carbonic acid ; and the occurrence of fat in the cellular tissue may perhaps be regarded as rendering this view more probable." (p. 16.) By the same convenient process, all the chemical transformations in the body may be most readily explained ; nothing is required but a table of the formulæ of the various proximate principles, and a competent knowledge of the rules of addition and subtraction. But it unfortunately happens, that a dozen or two of such explanations, differing widely from each other, might be framed by any ingenious person : and it might not be easy to pitch upon the right one.

We would not be understood as objecting to the application of chemical reasoning in explaining these transformations ; but merely to this random mode, which we fear may become too prevalent, in consequence of the real or supposed sanction given to it by the highest authority. Every person, in the least degree acquainted with the principles of logic, is well aware that, in all inferential or deductive reasoning, the liability to error increases in a very rapid ratio, at every step involving the least uncertainty. Where the data are insecure, and a moderate degree only of probability attends two or three subsequent stages of the reasoning, the chances are very much *against*, rather than in favour of, the correctness of the conclusion to which they lead. It seems to us that Dr. Jones has forgotten this important principle ; and has reasoned upon that which *may be*, as if it actually *were*. He commences his fourth chapter in the following manner : " It has been shown that uric acid may be produced from the gelatinous as well as from the albuminous tissues ; that from the changes which take place in the tissues, uric acid may be formed." Now we would not be understood as denying the truth of the position. It may or may not be correct ; but we simply say that Dr. Jones has not proved it, or even rendered it probable. His only argument is derived from the deposition of the urates in the gelatinous tissues surrounding the joints, of which we have already shown the fallacy ; and from the *possible* transformation of gelatine into uric acid, by the subtraction of certain elements. We would undertake, upon the same plan, to convert (theoretically) any azotized substances into uric acid ; and it would only require the addition of a few atoms of ammonia, and other small alterations of the like nature, to elaborate uric acid, *on paper*, out of starch or sugar. But until this or any other transformation has been shown to be possible, in the laboratory of the chemist, we shall not regard it as proved to take place in the living body.

For the discussion of details of this kind, however, it is not requisite that we should diverge further from the main question—the source of the over-production of lithic acid in the body, and the mode in which it may be prevented. Considering with Liebig, that the whole of this acid existing in the urine is the product of the decomposition of the tissues, Dr.

Jones proceeds to inquire into the conditions of its undue appearance. He supposes that, when an increased amount of decomposition of the tissues occurs, in consequence of the excessive action of oxygen upon them, no additional excretion of uric acid will take place; since the supply of oxygen is sufficient to convert it all into urea. The increase in the proportion of uric acid he attributes solely to the deficient action of oxygen; so that the change which ought to take place within the body, does not occur. The following quotation will exhibit his views. He states it as a general law, that " the quantity of uric acid which is thrown out of the body varies inversely with the quantity which undergoes a change in the body;" and thus continues:

"On looking to the agents which effect this change, it is seen that oxygen is the most absolutely necessary, and that the other agents, the heat, water, and alkali, are chiefly useful, inasmuch as they enable and promote the action of the oxygen on the uric acid in the body. Thence it may be concluded, that the quantity of uric acid which is thrown out varies inversely with the amount of action of the oxygen; and thus the problem of the cure of the uric acid diathesis depends, tonics being excepted, on the question, how the uric acid in the body can be most acted on by oxygen, how it can be changed into urea and carbonic acid. It appears that this may be done—

"1st. By giving a large supply of oxygen, as by exercise, by cold air, and by medicine, as nitrous oxide water and iron.

"2d. By diminishing the quantity of other substances, on which the oxygen acts more readily than on the uric acid; that is, substances consisting of hydrogen, carbon, and oxygen only; as by abstaining from these as food, by removing them by aperients, and by sudorifics.

"3d. By keeping all the uric acid which is produced, in solution, by water, and by alkalies." p. 23.

The increase of oxygenation resulting from exercise and from cold, has already been remarked upon in our review of Liebig's work. That supposed to be produced by nitrous oxide water is hypothetical. That occcasioned by the administration of iron is much more certain. We know that, whether the iron they contain be or be not the chief instrument of their efficacy, the red corpuscles are the principal carriers of oxygen from the lungs to the systemic capillaries; and we also know that a decided increase in their number takes place, during the administration of iron, in anemic states of the system. In one of the cases of chlorosis mentioned by Andral, the proportion of red corpuscles had sunk from 127 in 1000, to no more than 49·6; and, after the administration of iron for a short time, it was found to have risen to 64·3. In another case, in which the remedy had been longer persevered in, the increase was from 46·6 to 95·7, or more than double. Thus, then, it will be very easy for Dr. Jones to verify his reasoning by an appeal to experience, and we should recommend him to do so before he again comes before the public to direct the treatment of disease on chemical principles. As we have already pointed out, the *proportion* of lithic acid in chlorosis is *less* instead of *more* than that which is found in health; and the *absolute* quantity is very far less. The contrary would be the result of Dr. Jones's theory; and the return to the natural standard would be coincident with the multiplication of red corpuscles. As chlorotic patients are so very easily to be met with, we trust it will not be long ere Dr. Jones furnishes us with an account of his experience on this point. We should add that he attributes to iron and similar tonics

the effect of "rendering the vital powers more capable of resisting the action of the oxygen on the tissues of the body."

On the second class of measures for occasioning the oxygenation of the uric acid, Dr. Jones insists strongly; and we shall hereafter see, that he makes it the foundation of the regimen he considers applicable to the treatment of gout and gravel.   The non-azotized substances, which predominate in most forms of vegetable food, and which do not serve (according to Liebig) for the nutrition of the albuminous or gelatinous tissues of animals, have a strong affinity for oxygen; and if they are present in the fluids in too large an amount, they will become oxidized in preference to the uric acid, and will thus prevent it from being converted into urea.   These are chiefly thrown off by the respiratory apparatus, when in an oxidized condition; in the secretion of the liver and intestinal glands, on the other hand, there is little or no addition to their natural proportion of oxygen.   Hence, according to Dr. Jones, we may diminish the proportion of these readily oxidizable substances in the blood, not only by stopping the supply, but by causing an increase of secretion from the liver and intestinal glands through the action of purgatives, and especially of mercurials.   These medicines will have the further effect of causing the secreted products to be discharged from the intestinal canal, instead of remaining to undergo partial re-absorption and oxidation, as is supposed by Liebig to be the case in regard to the chief elements of the bile.   It is upon this principle that Dr. Jones explains the beneficial action of medicines which promote the secretion from the liver, in the treatment of gout; and we have little doubt that it may be correct as far as it goes.   The quantity of these non-azotized substances may be further reduced by emetics which produce bilious vomiting; and by sudorifics.   In regard to this last class of medicines Dr. Jones remarks, that "the great benefit which is occasionally experienced from the sudorific medicines is not thus, perhaps, sufficiently accounted for; because the quantity of these substances which can be removed by perspiration cannot be supposed to be very great."   *We* find no difficulty in accounting for it by the fact, altogether overlooked by Dr. Jones, that a large quantity of azotized matter, not very unlike urea, is excreted from the skin; and the quantity left to be thrown off by the kidneys is therefore just so much less.

With regard to the third indication, Dr. Jones remarks that the effect of an increased supply of fluid is not confined to dissolving the excess of urate of ammonia, which would otherwise be deposited as a sediment; but that it also favours the further oxygenation of the uric acid.   This is, we presume, the idea on which Liebig would explain the presence of urate of ammonia, almost to the exclusion of urea, in the urine of birds.

We now come to the application of these principles, in the cure or mitigation of the uric acid diathesis.   We are by no means disposed to deny their partial correctness; but we do not think that the disordered state in question is by any means sufficiently accounted for upon the hypothesis of Liebig; and if this be adopted in the exclusive manner in which Dr. Jones has set it forth, it cannot but lead, in our opinion, to great errors in practice.   There are many points of treatment, regarding which there cannot be much question, whatever hypothesis be adopted; such are the propriety of exercise, pushed to as great an extent as may be, without

such fatigue as shall permanently depress the vital powers; and absti-
nence from superfluous sleep. These measures are insisted on by Dr.
Jones, as augmenting the quantity of oxygen introduced into the blood;
but their acknowledged efficacy may be equally well explained in another
way. For if it be supposed that, in man, the uric acid is chiefly formed
at the expense of the *superfluous* azotized compounds in the blood,—then
active exercise, and abstinence from unnecessary sleep, tend to draw off
these substances, by converting them into newly-organized tissue, the
product of whose decomposition may be urea. The most important rule,
however, is the one on which the greatest question is likely to be raised,
—the proper diet to be adopted. It is well known that much success has
attended the treatment of the lithic acid diathesis, by a diet, containing
but a small proportion of albuminous ingredients, and a large proportion
of farinaceous matter; a measure suggested by the very obvious idea, that
the stoppage of the supply would be likely to induce a diminution of the
product. On the other hand, many authorities have maintained that
more benefit is derivable from a moderate diet in which animal flesh shall
greatly predominate. Now we cannot help imagining that there has
been a want of discrimination in regard to the causes of the uric acid
deposit; and that one or the other kind of diet may be preferable in par-
ticular cases. That the disease may be brought on by the simple excess
of mal-assimilated albuminous matter, resulting from habitual indulgence
in an excess of food, we think that common experience fully proves; and,
from the considerations already urged, (p. 504,) we cannot but regard it
as probable, that the superfluous azotized matter ingested, passes off in
the form of urate of ammonia, without becoming part of the tissues at all.
What remedy can be thought of as so likely to be successful in such cases, as
a diminished ingestion of albuminous matter, so as to afford no more than
the necessary supply to the tissues? We fearlessly appeal to the test of
experience in this matter. Who, as Dr. Graves well remarks, ever heard
of a case of gout amongst the potato-eating peasantry of Ireland? Who,
we will add, ever heard of one among the oatmeal-feeders of Scotland?
We will venture to affirm that there is an equal rarity amongst the rice-
feeding Hindoos, low as is their oxygenation, in consequence of the warmth
of the surrounding medium. Every practitioner must have met with
examples, in which a simple reduction in the quantity of animal food in-
gested, has caused an immediate disappearance of the lithic acid from the
urine. Sometimes it is necessary to push this reduction to a still greater
extent; thus, we have known an instance in which no decided benefit
was obtained, until the patient was restricted to the Hindoo diet of rice
and capsicums, which produced a complete cure. Upon Dr. Jones's
principles, this ought to have produced the most serious aggravation;
for the diet which he recommends, is one from which starch and other
non-azotized substances are almost completely excluded.

But we are well aware that such cases form only a part of those, in
which lithic acid deposits appear in the urine. Of these, some are clearly
attributable to the excessive production of lactic acid in the stomach;
and in these, such a diet as the one just mentioned would be extremely
prejudicial, on account of the tendency of farinaceous and saccharine
matter to be converted into this acid. In cases of this kind, it is doubt-
less of service to exclude such substances almost completely; and to se-

lect those which are least liable to undergo conversion into lactic acid. The same diet would doubtless be useful in cases, if such there be, to which the hypothesis of Liebig is applicable; since a superfluity of non-azotized matter in the blood will necessarily occasion a withdrawal of a part of the oxygen for their oxidation. But it must be remembered that, upon Liebig's own showing, the best diet for man is one in which sufficient non-azotized matter is ingested, to supply what is required for respiration; since otherwise, it would be necessary to eat a very much larger amount of animal flesh, to afford the carbon requisite for the process. Any such increase would provide more work for the kidneys, and would therefore be injurious. Our principle would be, to regulate the diet in such a manner, that the patient shall take in just enough, whether of azotized or non-azotized materials, to supply the wants of his system, and no more. This is the direction of Sir W. Temple, himself a sufferer: "Simple diet, limited by every man's experience to his own easy digestion, and thereby proportioning, as near as well can be, the daily repairs to the daily decays of our wasting system." A part of the difference of opinion in regard to the results of a sparingly-azotized diet, may be due to the fact, that it is least likely to succeed in those whose digestive powers are enfeebled by a long course of excess, and by repeated attacks of the disease to which it leads,—in consequence of the difficulty which such persons have in the digestion of most vegetable substances. We believe that if a comparatively young and vigorous person, suffering it may be through hereditary tendency to this disorder, will rigorously adhere to a diet as little azotized as possible, and will combine this with exercise, and other simple prophylactic measures, he may keep himself free from the recurrence of it. Few of the auditors of the late Dr. James Gregory, of Edinburgh, will have any doubt on this point.

Respecting the operation of purgatives and sudorifics, Dr. Jones's theory has already been given. He considers them peculiarly efficacious in gout, in which, according to Liebig, the excess of *non-azotized* compounds in the blood, abstracting the oxygen required for the conversion of the uric acid into urea, is the essential character of the disease. When Dr. Jones has shown us what becomes of the azotized matter in the body of a man who eats twice as much animal matter as his inert system requires for its reparation, we may begin to open our understandings to this theory; but at present they are obscured by a cloud which our unaided common sense cannot disperse. If this were the true explanation, gout would be one of the commonest diseases of the ill-fed labouring population, and comparatively rare in the luxurious aristocrat.

We shall not follow Dr. Jones into any further detail upon this part of the subject; since he does not offer any new therapeutic indications, but confines himself to explaining the *modus operandi* of those of acknowledged efficacy. This, we think, may be made to suit principles of a different character, at least equally well.

The Oxalic Acid Diathesis is the next subject treated of; and as Dr. Jones's notice of it is merely an expansion of Liebig's doctrine, that a partial oxidation of uric acid, not sufficient to produce urea, may generate oxalic and carbonic acids, we need not detain our readers by dwelling upon it. We may remark, however, that this principle, if correct, is of great importance, as leading to a much more rational plan of treating this diathesis than any before adopted. *This* conversion is not

a theoretical one, but may be effected in the laboratory; and the frequent alternation of oxalic and uric acids in calculi is a pretty evident proof of their close chemical relation. The treatment of this diathesis will be the same, therefore, as that which is found to be satisfactory in curing the uric acid diathesis; and we need not attach any importance to abstinence from saccharine substances, which were formerly considered as the source of it, since there is no evidence whatever that oxalic acid is ever formed from sugar in the living body.

In the chapter on the Phosphatic Diathesis we do not find anything peculiarly worthy of note; except that Dr. Jones lays much stress on the avoidance of articles of food which contain phosphorus or the phosphates in large amount, and shows from late researches that these substances are much more generally diffused through organized products than is usually supposed.

The remainder of Dr. Jones's treatise consists of a summary of the different characters of calculi, and an account of the attempts that have been made at various times to get rid of them by the action of solvents. In this we find nothing worthy of note; and, having already occupied the space permitted to us, with the discussion of what we regard as the leading principle or *idea* of the book, we shall close it with a word of friendly advice to its author, and to other young chemists who may be led to commit themselves in a similar manner to the captivating novelties of an ingenious theory. No one can reasonably object to their *adoption* of principles put forward by so eminent and commanding an authority as that of Liebig; but they should remember that these principles are confessedly theoretical; and we feel sure that their author would be averse to the deduction of rules of practice from them, until they have been tested by more extensive examination, both chemical and physiological. We hold that any one who comes forward to instruct the public in any new mode of practice, especially one that is founded upon abstract principles, is bound to test the correctness of his views in every possible way, before he lays down, *ex cathedrâ*, the rules of treatment which the practitioner is to follow. For what is the result, if he comes forward, as we think Dr. Jones has done, too hastily? The book falls into the hands of a number of persons quite unqualified to judge of the correctness of the principle on which the rules of practice are founded; they have heard from high authorities that Liebig is next to infallible; and, startled at the array of incomprehensible symbols which the theoretical discussion presents, they turn to the practical portion, feeling sure that a pupil of the great Maestro, interpreting his doctrines, *must* be right, and delighted at the prospect of having some plain and simple code by which they may be governed in the treatment of this perplexing class of disorders. It is on this account that we have thought it our duty to criticise the work with peculiar attention. We have bestowed no slight amount of time and thought upon it, that we might not be open to the imputation of having hastily disposed of the first application of Liebig's physiological doctrines to the science of therapeutics. But we must add, that we should have been saved a great deal of trouble, had our author's train of reasoning been more clearly expressed, or his style less faulty. The sentences are long and involved, and their grammatical construction is often extremely defective. In proof of this we refer the reader to the second paragraph in p. 8, and the latter half of p. 10.

ART. XVIII.

1. *Report on the Effect of Interment of Bodies on the Health of Towns. Ordered by the House of Commons to be printed,* 14th June, 1842.

2. *Health of Towns. A Bill for the Improvement of Health in Towns, by removing the Interment of the Dead from their Precincts. Prepared and brought in by* Mr. MACKINNON, Mr. COWPER, *and* Mr. BECKETT, 5th August, 1842.

3. *Ueber den Einflusz der Verwesungsdünste auf die menschliche Gesundheit, und über die Begrabnissplätze in Medizinisch-politzeilicher Beziehung.* Von Dr. V. A. RIECKE.—*Stuttgart,* 1840.   12mo, pp. 221.

On the Influence of Putrefactive Emanations on the Health of Man, and on Burial Grounds in their relation to Medical Police. By Dr. V. A. RIECKE.—*Stuttgart,* 1840.

ON a former occasion we noticed the exposure of the abominations practised in the metropolitan burial-grounds, which Mr. Walker published under the somewhat quaint title of " Gatherings from Grave-yards." Since that time these abominations have been brought more and more into public notice until the last session of parliament, when Mr. Mackinnon obtained a parliamentary committee to consider the expediency of framing some legislative enactments, (due respect being paid to the rights of the clergy,) so as to remedy the evils complained of. This committee deemed it expedient to consider the subject under the three following heads :   1. Whether the custom of interments within the precincts of large towns or populous places be injurious to the health of the community ?   2. In the event of the injury being proved, what remedies could be suggested ?   3. In what manner the remedies ought to be applied, so as not to interfere with vested rights ?

The committee report, with regard to the first head of the inquiry, that they cannot arrive at any other conclusion than that the nuisance of interments in large towns, and the injury arising to the health of the community from the practice, are fully proved.   The committee, then, recommend, with reference to the second head, that such legislative enactments should be framed as would prevent the interment of the dead in or near the habitations of the living.   Under the third head an instructive lesson is taught the medical profession, it being recommended that in framing these enactments, particular attention be paid to the vested interests of the clergy and parish clerks.   It appears, however, that there has been a very singular, and we cannot help thinking, an undignified collusion between some of the clergy and the undertakers ; the former selling to the undertaker the hatbands and scarves with which they are provided by the friends of the deceased, or, in other words, receiving a sum of money instead of them, termed " a complimentary fee."   The evidence of the Bishop of London is as follows :

" 3016. Does the fee usually pass as between individual and individual, or does it pass through the undertaker as a part of the funeral charge ?   I think the practice is not with the middle classes of society to give complimentary fees ; they give fittings, but there is a good understanding between the undertaker and the clergymen, generally, as to the fittings.   In some instances I have known

them amount to pounds; the clergyman's complimentary fee is substituted for the fittings. It depends much upon the class of persons; if a vicar goes, he gets a hatband and scarf, and for that hatband and scarf, ten shillings are placed in the hands of the clergyman."

This is one of the " vested rights;"—to have a hatband and scarf. Some of the statements respecting the condition of our grave-yards are curious. The streets of London, according to Dr. Lynch, stink of the church-yards. That gentleman says:

" 2683. We know, (Dr. Lynch, his colleague and assistant,) the symptoms of the dead-damp; it is a peculiar indescribable smell, and any gentleman coming up Parliament street may have remarked it; we had the same smell yesterday, and the same to-day; and when I had got a quarter of a mile from this place, coming along Parliament street, a certain state of the wind will bring it palpable to the nose.

"2684. From whence did the stench come? From the church-yards."

The details elicited by the committee are infinitely disgusting and inexcusably disgraceful. But the evil is working its own cure. People cannot now even bury their dead out of their sight, except by methods the most revolting. A person named Targit, of Southampton, raised a newspaper discussion, because not only had the coffin of his deceased wife been exposed, but it had been broken in, and a portion of the drapery exhibited. Mr. Targit ought to have been thankful that the sexton did not hack his wife and her coffin to pieces, and carry the coffin home in a sack for firewood, as is practised in some of the metropolitan burial-grounds. Mr. Baker, of Leeds, mentions a circumstance of which he was an eye-witness. He was with a sexton while digging a grave. Two coffins were opened, and the fresh bones thrown on the surface, when a by-stander said to Mr. Baker, " Look! these are the skulls of my father and my brother, and the bones of my relations; is not this a bad business?" Mr. Baker adds that the speaker was very much shocked, as well he might. There never could be a reasonable doubt entertained that the mode of interring the dead practised now in England is highly injurious to the public health and offensive to public decency, as stated in the preamble to Mr. Mackinnon's bill. It may be doubted, however, whether that bill grapples fairly with the evil. The main questions are medico-legal, and are comprised in the history of the putrefactive process. For example, the size of a ground, (and of course the expense,) will depend much on the nature of the soil, the depth of the graves, and the period a corpse should remain undisturbed. This period is the time required for complete decomposition, a process occupying from six months to thirty years, according to varying circumstances. These circumstances we shall presently notice, remarking here, that in the report there is much less of that *precise* information respecting them than might have been reasonably expected, and still less reference made to them in the proposed enactment. Clause 2 fixes the distance at which cemeteries shall be permitted, at two miles for the metropolis, and one mile for other cities and towns. Clause 4 forbids the disturbance or excavation of existing burial-grounds for twenty years after the last interment. Clause 5 proposes to fix the number of hours a body shall be permitted to remain unburied. Clause 14 provides that the fences of cemeteries shall be of the height of ten feet; and Clause 31 enacts that no grave shall be

opened oftener than twice in four years. These five clauses are all (of thirty-eight in the bill) which refer to the medico-legal portion of the question.

As the work of Dr. Riecke (it is a prize essay) contains a complete review of the whole subject, and as, perchance, the opinion of some of our readers may be requested, we will endeavour to supply them with a short analysis of the practical portion of the essay. The subject is arranged in two divisions, the first being devoted to an examination of the influence of putrefactive emanations on health. Dr. Riecke abundantly proves by numerous positive facts that these emanations are injurious to the health; and, while he acknowledges the correctness of Du Châtelet's observations to the contrary, shows that they are exceptions to the general rule, easily explicable, or that some of the attending and modifying circumstances have been suppressed or not observed. Du Châtelet found that at an establishment at Montfaucon from 10,000 to 12,000 horses, and from 25,000 to 30,000 smaller animals are flayed every year. The stench even to his seasoned nostrils was indescribably horrible, yet the knackers' men and boys were healthy, strong, and long-lived; nor was one of their number attacked by the epidemic cholera when raging around them; as if the abominations in which they lived were rather prophylactic of disease than excitant. Dr. Riecke observes that many of the workmen were born and have lived all their lives on the spot; that in fact they are acclimated; and this explains the whole marvel. Otherwise, we might say with the inhabitants of Walcheren, that malaria is not pernicious, because men and women exist in a malarious atmosphere. The plain truth is that a sufficient habituation of the system to poisons of any description is highly prophylactic. The negro living near marshy swamps is in no more danger from the miasm, which would destroy a European in forty-eight hours, than the vaccinated European is from smallpox. Yet in discussions on contagion and infection, this important fact of habituation is continually overlooked. Dr. Riecke takes other opposing facts brought forward by Orfila, Dunglison, Ollivier, Eisenmann, and others, examines them, and refutes the inferences deduced from them; satisfactorily showing that putrefactive emanations are not salutary nor even capable of curing consumption, as has been gravely asserted.

We cannot follow Dr. Riecke through the numerous observations he has collected from various sources in proof of the proposition that these disgusting emanations are injurious to the health, and often immediately fatal. To our minds the proof is complete; whilst every deduction of the author is confirmed by the facts stated in the report of the parliamentary committee. His observation that animal effluvia give a typhoid type to intermittents is interesting; and also that contagious effluvia may be generated in a body for some time after death. The general conclusions at which our author arrives are principally these: that putrefactive emanations are hurtful in a varying degree as circumstances vary. If highly concentrated they produce apoplexy or immediate death; if less concentrated, headach, debility, loss of appetite, putrid fever, &c.; and that specific poisons are not necessarily destroyed by the putrefactive process.

The second division of the work is devoted to a consideration of burial-grounds. The various modes in which man disposes of his dead are

noticed, and the practice of interring in churches and church-yards is traced historically. It appears that so early as the fifteenth century intramural sepulture was found to be a nuisance, and was forbidden in Nuremberg, except in churches; and this exception ceased in 1571. In the seventeenth and eighteenth centuries, the evil having increased with the population, practices like those complained of in England were found generally prevalent in France and Germany. The medical profession particularly in France, true to its noble purposes, was the first to war with the prejudices of the times, and to teach the truth not more by precept than example. A Parisian physician had the following epitaph to his memory :

> " Simon Pierre, vir pius et probus,
> Hic sub dio sepeliri voluit,
> Ne mortuus cuiquam noceret,
> Qui vivus omnibus profuerat."

At Louvain there is the tomb of a celebrated anatomist, with the following ;

> "Philippus Verhagen
> Med. **Dr.** et prof.
> Partem sui materialem
> Hic in cœmeterio condi voluit,
> Ne templum dehonestaret
> Aut nocivis halitibus inficeret."

The discussions excited by the profession were followed by the prope results. In 1774 the parliament of Toulouse ordered a cemetery to be formed outside the city; Laon, Dôle, Lyons, and other towns imitated the example of Toulouse. A government edict was issued on March 10th, 1776; and in 1780 extra-mural cemeteries were formed at Paris. A Prussian cabinet-order, directing extra-mural sepulture was issued in 1775; the Swedish government in Pomerania took up the matter in 1778 ; Wirtemburg in 1782. In 1784 the Emperor Joseph carried out the plan begun in 1772 by his predecessor, Maria Theresa, by issuing detailed regulations respecting the mode of interment. In 1786 in Hesse Darmstadt, it was ordered that bodies should be placed in regular rows ; the depth of graves was fixed, and also the time when a grave might be reopened. Saxony issued regulations on the subject in 1792; East Friesland in 1818 or 1819.

Specific regulations for the management of cemeteries and the interment of the dead were first issued in France on June 12th, 1804 ; and afterwards at Aaran (Prussia) in 1808. Although England is forty years behind France in this respect, it is worth knowing that edicts, cabinet-orders, &c. have often been useless. The truth is, there is a vast amount of unmitigated prejudice and superstition in the world respecting the disposal of dead humanity. Priests have always derived their richest harvests from death and the grave, and have invariably been the foremost to denounce all, or, if not all, any effective interference. Dr. Riecke states that in many places in Germany the dead are still interred in church-yards near to dwellings. Napoleon planted the cemetery-police laws of France in the countries he conquered; at Rome, Naples, Madrid; in Portugal, the Rhenish Provinces, and the Netherlands. The Dutch sturdily resisted the innovations; and so their churches, in spite of the Empe-

ror, stunk as abominably as the worst of our own sacred charnel houses.
In the province of Tras os Montes (Portugal,) the people pulled down the
fences of the closed church-yards that they might get their dead placed
within the consecrated inclosure; and in many places in the Peninsula,
the corpses already interred in the new cemeteries were disinterred and
carried to the churches. In Upper Italy, the Austrian government found
great difficulty in compelling obedience to its new rules. At Catania the
propriety of extra-mural sepulture was agitated by some enlightened indi-
viduals; but they were hotly and successfully opposed by a fraternity of
pious Capuchins who had contrived to make the road to heaven through
the vaults of their abbey-church; and a most profitable road it was for
the proprietors, the toll being heavy. The English clergy generally are
too enlightened to be guilty of such selfishness, still there is evidently
a tendency to stand upon vested rights and exclusive privileges. Mr.
Mackinnon apparently knows this; we meet him, cap in hand, before the
clergy, in almost every clause of his bill.

Having gone through his subject historically, Dr. Riecke enters on the
practical part. The first question he considers is the distance from the
town at which a cemetery should be placed. This has been variously
stated, as the following table will show.

> French regulations of 1804, at 114 to 130 feet.
>
> Arnsberg in Prussia, not less than 500 paces.
> Stralsund in Prussia,   ,,   1000 paces.
> Sigmaringen, earlier regulations, not less than 500 paces.
>   ,,   later regulations,   ,,   275 feet
> Grand-duchy of Baden   ,,   717 feet.
> According to the opinion of Gmelin, 1000 to 2000 paces.
>   ,,   Mr. Atkinson, half a mile.
>   ,,   Dr. Copland and Mr. Walker, 2 miles.

Dr. Riecke observes that emanations are carried farther than people
generally suspect. The stench of the carrion-pits at Montfaucon is in-
supportable at a distance of 6500 feet, and with a favorable wind at
double that distance. The stench is even perceptible at four times that
distance, or about five miles, under favorable circumstances. There is
a church-yard at Stuttgart in which 500 bodies are interred yearly. The
graves for adults are six feet and a half (English) deep, and for children
from three and two-thirds to five one-third feet. Yet a north-west wind
renders the putrefactive emanations arising from the ground perceptible
in houses distant from 250 to 300 paces. The distance of a cemetery
must vary according to circumstances; as, for example, the cemetery for
a small population may be nearer than for a large population. The
following are Dr. Riecke's recommendations:

> *No. of Inhabitants.*   *Distance of Cemetery.*
> 500 to 1000 .... a minimum of 150 paces.
> 1000 to 5000 .... 300 paces.
> above 5000 .... 500 paces. (p. 98.)

Cities increase rapidly; it is therefore right to provide against the ap-
proximation of buildings to cemeteries, especially when a city occupies
itself in " walking out of town," to use Dr. Copland's bow-bell phrase.
The Sigmaringen regulations forbid houses to be built on the ground in-
tervening between the cemetery and the town; those of the Grand-duchy

of Baden fix the distance from the cemetery at which houses may be built at 1120 feet. A French imperial decree of March 7th, 1812, orders a minimum distance of 325 feet.

How long ought a grave to remain undisturbed? for the size or cost of a cemetery will be greater or less as this period is shortened or prolonged. It is a common wish of mankind to be at rest after death; to repose, literally, in the grave. A penurious economy or a crowded population is not favorable to the indulgence of such a simple prejudice. In some of the London burial-grounds, bodies are turned out of their last homes before they have even become putrid; and are literally hacked to pieces to make room for the numerous new arrivals. A burial-farce is continually being performed, followed by a one act tragedy. The following is an instance from the Report; Mr. Geo. Whitaker *loquitur*:

"400. I have seen coffins broken in the graves, and shovelled away to make room for fresh comers. And the bodies cut to pieces? Decidedly so. How do you mean? Cut with the spade."

A grave-digger at St. Clement's Lane, does not mince the matter, although he minces his "subjects."

"2360. I have taken children up and moved them within a week after they were buried. Sometimes, you say, you have placed them nowhere? I have done away with them. What do you mean by doing away with them? Breaking the coffins up, and cutting the flesh in bits, and burying it."

That sort of work is disgusting, but it is equally unjust to give the dead the exclusive occupancy of their graves for ever. They must be disturbed at sometime, and, medico-legally, that time is indicated by the termination of the putrefactive process. The feelings of survivors, and, in populous places, the survivors themselves do not continue longer than the time so required. We may observe that decay is complete when the soft parts have entirely mouldered away and disappeared. Bones will remain whole for centuries.* The time occupied by this process and during which the grave ought to remain unopened has been fixed differently by different governments.

	Years.
The principality of Lippe	30
Hesse Darmstadt (1786)	30
Aaran, Prussia	25 to 30
Sigmaringen (1834)	30
do. (1836)	20 to 25
Frankfort on the Maine	20
Stralsund, Prussia	16
Wurtemburg	18
Milan (1791)	10
Stuttgart	10
Munich	9
France	5

Individuals have also fixed the time differently. Gmelin at from thirty to forty years; Von Wildberg at thirty; Frank, twenty-four to

* It is not long since we witnessed the opening of a stone coffin, whose tenant had during life been an ancient Roman gentleman, and who could not have occupied his narrow residence less than 1400 years. The teeth were all sound, and several of the larger bones scarcely touched by decay. The coffin, it must be observed, was embedded in a clayey soil.

twenty-five; Mr. Walker at seven; Rev. Mr. Tyler at fourteen; and Tagg, a London cemetery proprietor, at twelve years. None makes the time so short as Mr. Mackinnon. The time, however, can be no fixed quantity; for, putrefaction being a chemical process, will, like other chemical processes, be variously influenced as to its duration by varying agencies. Electricity, limited or free access of atmospheric air, temperature, (65° to 100° of Fahr. is most favorable, nature of soil as regards lightness, dryness, chemical composition, &c. all modify the process. A high and dry temperature mummifies bodies, especially those that are lean; water at a low temperature saponifies them, and the more readily if fat; rendering them at the same time very durable. One body putrefies sooner than another under apparently similar circumstances. Corpses of the young decay more quickly than corpses of the old; of women sooner than of men; of fat people sooner than of thin. The disease of which the individual died makes a marked difference; and so also his trade. The sexton at Stuttgart corroborates the opinion of Shakspeare's sexton in Hamlet, that the corpses of tanners decompose the most slowly. The depth of the grave has a considerable influence; the deeper, the colder, and the more wet, and consequently the slower the decay. Besides, insects cannot assist the putrefactive process, if warmth and air cannot penetrate to the corpse. Much clothing and a coffin of hard wood retard the process. It is of the greatest importance, however, to know the septic or antiseptic influence of various soils, and in this part of his subject our author is very minute, quoting a great variety of experiments and observations. Soils differ as well in their chemical composition as in their consistence, capacity to absorb and retain warmth and moisture, to abstract oxygen from the air, &c. Argillaceous, ferruginous, loamy, aluminous soils are unfavorable to putrefaction; so also the soils containing humic acid, as for example, moor-earth and bogs. Ireland furnishes illustrations of this fact from time to time, bodies having been taken out of bogs nearly perfect after many years' immersion. Clayey soils, besides being antiseptic, have the additional disadvantage of becoming deeply fissured in hot dry weather. Sandy, marly, and calcareous soils favour putrefaction. We observe that Colonel Fox took every opportunity of inquiring whether the prejudices of the people would allow of quicklime being put into the coffin, and the witnesses generally answered in the negative. It is curious to find how ancient the practice is, for Frank quotes directions from the Talmud, to the effect that the corpse be covered with quicklime with the object, expressly stated, of accelerating decomposition. The ordinance of the Emperor Joseph directed that the corpse should be inclosed in a sack or shroud only, and the grave filled with quicklime. In Hesse Darmstadt, in 1786, it was ordered that quicklime should be put into the grave, and also at Milan, in 1791.*

This varying influence of soil on the dead has not been overlooked in

* Gypsum has been occasionally used for the preservation of bodies. In the museum of the Yorkshire Philosophical Society, there are two plaster casts of corpses taken out of stone coffins of great antiquity, and which were dug up near York. One had contained the body of a young female. The impressions of the trunk, hips, and thighs, as well as of the sandals in which she had been interred, were very distinct. The teeth were the only remains of the body. Metallic ornaments, as rings and ear-rings, and the iron nails in the soles of the sandals were found in the cast.

cemeterial ordinances.   According to the Arnsberg regulations, a corpse interred in boggy or clayey soils shall remain undisturbed for from twenty-five to thirty years; in loamy soil twenty years: in calcareous or sandy soils ten years.   In the Grand-duchy of Baden, a grave in a clayey soil remains unopened for twenty-five years, in a sandy soil for twenty years.   We have seen that in France the prescribed period is five years, and Dr. Riecke very naturally inquires why there is so great a disparity in the regulations of the two countries.   He thinks climate may make a difference, and also the custom of stamping the earth down upon the corpse, common in Germany.   He comes to the conclusion that, all circumstances considered, the grave of an adult should remain unopened for nine or ten years, and of a child seven or eight years.

Burial-grounds should be well drained, and if with a rocky substratum, the latter should not be too superficial.   Waste lands, recommended for funeral purposes by Plato, are often unsuitable and far from being economical; the nature of the soil, extent of inclosure, and distance from the town, &c., may render them very expensive.   Elevated cemeteries are good; and the higher the elevation the nearer they may be permitted to the city, as putrefactive gases are lighter than the atmosphere, and ascend.   On the contrary, cemeteries below the level of the surrounding houses are very bad.   Cemeteries should be so placed as to be easily accessible and not liable to be flooded.   The topographical position should be attend to.   The Arnsberg regulations recommend that the cemetery be placed to the east or north of the town; the Sigmaringen to the north-east; the Baden to the north or north-east.   The reason is obvious.   The south and west winds being moister, hold the putrefactive gases in solution more readily than the north or east.   If possible a slope to the south should be secured; the cemetery will be drier and warmer, and therefore better; for moderate dryness and warmth promote putrefaction.

The depth of graves has been variously fixed as appears from the following :

By France	4 ft. 10 in. to 6½ ft.	Munich	6 ft. 7 in.
Austria	6 ft. 2 in., *if lime be used.*	Frankfort on the Maine	5 ... 7 ...
Hesse Darmstadt	5 ft. 7 in. to 6½ ft.	Arnsberg, minimum	4 ... 7 ...
Sigmaringen	6½ ...	Dr. Copland	6 to 7 ft.
		Bishop of London	4 to 5 ...

The age of the deceased should make a difference in the depth of the grave.   The Sigmaringen regulations direct that the coffin of a child shall be four feet below the surface.   In the Grand-duchy of Baden, a grave for a person above ten years of age must be five feet seven inches deep; for a child one sixth less.   At Aaran six feet nearly for an adult, and five feet for a child.   At Stuttgart, and at Glasshütte in the Erzgebirge, the depths are fixed relatively, as follows :

GLASSHÜTTE.			STUTTGART.		
Individuals under 8 years old	3 ft. 8 in.		Individuals under 8 years	3 ft. 9 in.	
,, from 8 to 14	4 ... 7 ...		,, from 8 to 10	4 ... 7 ...	
Adults	5 ... 6 ...		,, from 10 to 14	5 ... 7 ...	
			Adults	6 ... 7 ...	

Dr. Riecke recommends the first three depths of the Stuttgart regulations for children under seven years of age, for youths from seven to

fourteen. and for adults, or all above fourteen.   He supports these measurements by satisfactory statements.

To economise the ground, graves should be made in rows according to their depth ; children in one row, youth in another, adults in another. Family-graves should be in a distinct part of the cemetery, and arranged according to a fixed plan. These are made a luxury in parts of Germany, and well taxed : or altogether prohibited, as in Sigmaringen, Darmstadt, and Aaran.   We agree with Dr. Riecke in thinking that the policy of thus severing family ties and wounding domestic feelings is doubtful, considered morally.   And a real loss is experienced by the public in the absence of those elegant funeral monuments which not unusually decorate family tombs.

The size of the grave is fixed by several continental regulations.   At Stuttgart the grave of an adult must be six and a half feet by three and a quarter; and an interval of eleven inches nearly between each grave; making a surface for each grave of not quite thirty-one square feet.*   At Arnsberg and Munich the measurements are a few inches more or less than the preceding, making altogether a difference of two or three square feet.   The French regulations do not give the length ; only the breadth, and the thickness of the earthy wall or partition between each grave.   The former is fixed at four fifths of a metre, about thirty-one inches ; the latter at top and bottom at from eleven and a half inches to nineteen and a half, and at the sides from eleven and a half to fifteen and a half inches. A French grave, according to these measurements occupies a surface of from twenty-four to twenty-seven and a half square feet.   The Emperor Joseph's edict fixes the breadth at four feet, and the thickness of the partition at the same, giving a superficies of not less than seventy to eighty square feet.   The thickness of the partition wall averages eleven inches in Germany.   Dr. Riecke thinks this too little ; it should be at least double, or twenty-two inches.   In heavy soils the French maximum of nineteen inches might be adopted ; but in very light ground the partitions should be from three to four feet thick ; and under all circumstances, the deeper the grave the thicker must be the partition.   Our author deduces from various data that the length of a grave for an adult, should be eight feet three quarters, nearly ; the breadth four feet two thirds ; and the whole surface about forty square feet.   The grave of an individual aged from seven to fourteen years should occupy a surface of nearly twenty square feet; and if a child, not quite sixteen square feet ; the length and breadth for the latter, including the side and end partitions, being two feet nine inches and a half, and five feet seven inches.

We are enabled from the preceding data to calculate the size of a burial-ground for a given population, having a known mortality at various ages.   The rule Dr. Riecke proposes is, to multiply the average square superficies of a grave by the average yearly mortality, and again by the number of years a grave should remain unopened, and the product is the measurement required.   For example, a cemetery is proposed for a parish having 35,000 inhabitants ; the mortality being 1000 per annum, or one in thirty-five.   Of the whole number of deaths, one half, or 500, are adults ; 450 infants and children under seven years of age ; and the remaining 50 ranging from seven to fourteen.   Each individual of the

* This is Dr. Riecke's calculation.   We do not make it so much.

first class would require forty-eight square (Wurtemberg) feet of surface; each of the second, twenty-four, and each of the third, twenty square feet.   Each of the first class would require a decennial grave, of the second an octennial, of the third, a septennial.   The square feet required would be

English feet.		sq. ft.,	mortality,	age of gr.,	sq. ft.,	Eng. sq. feet.
54·72	Adults	48 ×	500 ×	10 =	240,000 =	273,600
27·36	Youth	24 ×	50 ×	8 =	9,600 =	10,944
22·80	Children	20 ×	450 ×	7 =	63,000 =	71,820

Giving a total superficies of   312,000 = 356,364 sq. feet.

The advantages of the plan of classifying the interments according to the age of the deceased are here obvious.   An average of thirty-five square feet to each corpse, and a decennial grave would raise the required land to a surface of 350,000 square feet; so that the preceding plan economizes 37,400 square feet of ground.   Of course, this is only an *average* calculation.   Soil and the other circumstances referred to will demand an increase or diminution in the factors.   Allowance must also be made for epidemics, and for the increase of population.   Walks between each row of graves would be necessary, which, in the instance just mentioned, Dr. Riecke calculates at 58,000 square feet; making a total surface of burial-ground for a fixed population of 35,000, equal to 370,000 square (Wurtemburg) feet, and being about 9·15 square feet (English) to each inhabitant.   The Sigmaringen regulations allow thirty square (Wurtemburg) feet, to each inhabitant; in the Grand-duchy of Baden, the allowance is twenty-five square feet; with undisturbed possession for the periods before specified.

The practice of having common graves for the lower classes is of high antiquity.   They were termed *pulticuli,* and were used in Rome in the time of Horace.

" *Hoc miseræ plebi stabat commune sepulchrum.*"

Common graves are barbarous things, and cannot be recommended as being either economical or decent.   In Paris they became such a horrid nuisance, worse even than they are now in London, that in 1804 they were prohibited altogether.   Augustus closed the Roman *pulticuli* for similar reasons.   Naples and Trieste have common graves resembling the pulticuli, and a most appalling spectacle do they present.

The free circulation of the air in burial-grounds, should not be checked by too high walls.   Ten feet, as Mr. Mackinnon proposes, is we think, an unnecessary height.   In France in 1804 it was fixed at six feet and a half; in Sigmaringen very lately, at three feet three quarters. Trees should be planted in groups and not in rows; for in rows they act like high walls.   A row, however, would be useful if planted between a burial-ground and closely adjoining houses.   Bones should not be collected and placed in catacombs but reinterred.   Chinks in clayey soils should be carefully filled with earth.   When a cemetery is applied to other purposes, the surface should not be disturbed for at least five years, as directed by the Sigmaringen and French regulations ; and if after the lapse of that period it be necessary to dig up the soil, the bones should be collected and reinterred.   No wells should be permitted within a certain distance of burial-grounds.   The Sigmaringen regulations fix it at 300 feet.

It appears that local inspectors of cemeteries are appointed in Germany, and with great advantage. The inspector should have a plan of his ground, so that he could at any time, accurately identify a corpse. He should also be so acquainted with the duties of his office, that the conduct of details might be safely left to his individual judgment.

The only buildings requisite in a cemetery are, a house for the inspector, a chapel, and a suit of apartments for the reception of the corpses about to be interred.

Dr. Riecke concludes his valuable essay by some judicious remarks on the propriety of so conducting and arranging burial-grounds, that they may be viewed rather as reminiscences of immortality than of death and destruction: and we are happy to say that the new cemeteries in the vicinity of London are all of this description. Well kept, judiciously planted, ornamented with graceful and elegant monuments, and retired from the confusing din of thronged streets, they might be made the best and holiest of temples. In these we hope to have Pére la Chaise improved on. There should be no clusters of nettles; no rotting wreaths of *immortels ;* no neglected graves overgrown with long grass, or " with garden flowers run wild ;" no shattered grave-stones ; no ruined tottering monuments ; the hoar of age might be left on them, but nothing more. The feelings touched by Gray's celebrated elegy, and to the touching of these feelings, indeed, its popularity must be partly attributed, are feelings common to all men ; and we believe are capable of such development as to be made no slight auxiliaries to good morals.

With respect to the proposed enactment we would observe, that it is obviously deficient in several essential particulars. This deficiency is perhaps partly attributable to a fear of attempting too much, but mainly, we suspect, to the neglect of Dr. Bowring's judicious recommendation to " gather together the different acts of legislation by which the objects of the bill have been accomplished in other countries, and so ascertain what difficulties have been overcome, and what rights and interests it had been found necessary to recognize." In our review of Dr. Riecke's work we have attempted to supply this want.

We would venture to suggest, as an *economical measure,* the propriety of having inspectors-general appointed who, having the necessary scientific knowledge, might be able to advise and direct the parochial authorities in the choice and size of their ground, and in the formation of their regulations. It would also devolve upon them to guide and control the public taste in the planning and planting of cemeteries, and the construction of funeral monuments. We would also venture to direct attention to the sixth clause of the bill, which constitutes the parson and churchwardens of one parish or more, a "Parochial Committee of Health." As the duties of this committee are simply to provide for the interment of the parochial dead, it is a " Parochial Committee of Burials," and nothing else. Things should be called by their right names. We honour parsons and churchwardens, but we think a committee of health, in the proper sense of the term, would be a laughable affair if they alone formed it.

Mr. Mackinnon may rest assured that he has the good wishes and respect of all the thinking portion (and that is now a large portion) of the medical profession.

Since the above article was printed, we learn that the home-secretary has requested Mr. Chadwick to extend his examination of the evidence on the sanatory condition of the population, to the special evidence on the effects of interment in towns. From the direction of Mr. Chadwick's inquiries it is apparent that he has in view the practicability of the appointment of officers of public health qualified by a professional education; and of charging them with the regulation of the places and modes of interment, and with the various arrangements connected with that practice, necessary for the protection of the public health. We learn that the evils of retaining the dead, often in the single room of the family, for long periods before interment, has been the subject of much inquiry from the medical officers of the unions, and is proved to stand in need of much further examination. The oppressive expense of funerals, and the exorbitant charges of the undertakers, are also subjected to a scrutiny, with the view to amendment. Such of our readers as have seen Mr. Chadwick's published Reports, or who have perused the first article in our present Number, will be prepared for some most important results from his inquiries.

Art. XIX.

A Treatise on Protracted Indigestion, and its Consequences. Addressed by the Author, on his retirement from the medical profession, both to the members of that profession and to the well-educated public, particularly parents. By A. P. W. Philip, m.d. f.r.s.— *London*, 1842. 8vo, pp. 367.

We have seldom risen from the perusal of any work, with feelings of greater surprise and disappointment than from that of the volume now before us. Regarded in either a literary or a professional point of view, this treatise is by no means worthy of Dr. Philip. The author's reasons for addressing the work to the public are both singular and amusing. After informing us that he could not " leave the profession with an easy mind," without communicating to it the important matters contained in this work, he adds, that, having found his professional brethren so dull as not to attend to his lucubrations, he now lays the facts before the public in order that they may be " led to insist on their physicians affording them the attention which their importance demands." (Pref. p. xviii.) Did it not occur to the Doctor, that besides " the difficulty of changing principles" long acted on, there might be one other reason why the profession generally may not have seen fit to embrace his peculiar views; namely, because those views did not seem deserving of adoption ? Besides, why address the " public," when there is constantly rising up a young race of practitioners, whose principles are not yet fixed ; who are as yet unwedded to system ; and from whom, accordingly, Dr. Philip's lucubrations would have met with dispassionate treatment ? We may moreover state our most firm persuasion that this appeal from the profession to the public will be wholly vain. A work more totally unadapted to the comprehension and tastes of non-professional readers, we have never seen. We ourselves have been obliged to abandon in despair the attempt to arrive at the meaning of large portions of it. The style through-

out is in the highest degree clumsy, obscure and complicated ; and the work seems to have been eked out by passage being added to passage, without any reference to methodical sequence. The book is moreover full of the most tedious repetitions of the same subjects and ideas in precisely the same language.

From the first to the one hundred and twenty-ninth page, the author occupies himself with attempts at illustrating the distinctions between the nervous and sensorial powers ; the various species of nervous influence, &c. And we feel it to be our duty to warn every one desirous of obtaining clear and accurate information on these subjects, not to expect it in the work before us. This part of the work consists of a mysteriously and laboriously worded statement of facts and doctrines in neuro-physiology perfectly familiar to tyros in that branch of medical science ; mixed with several dogmatic reassertions of antiquated errors. We must call attention to one of these ; for it would be unjustifiable in us to let it pass.

Thus at page 12, we find Dr. Philip, at this hour of the day, affirming that the " nervous power or influence," which has " been regarded as peculiar to the living animal," is possessed by " inanimate nature" " in common with" it, i.e. the animal. And in the same page, we are informed that after the " nervous influence has been wholly removed, and its functions in consequence have wholly failed, they are as perfectly performed (!) by voltaic electricity, as if the nervous influence itself had been restored ; and as we have no means of distinguishing any power but by its effects, the identity of the effects necessarily implies that of the power, as far as relates to its general nature." Ergo (in other words,) the nervous power and voltaic electricity are identical ! And this conclusion, the author tells us (page 12,) has been established by " the most conclusive of all tests, (query, experiments ?) which have been publicly repeated both in London and Paris," &c.

Now there is here either the grossest ignorance, or a serious want of candour. Surely Dr. Philip does not require to be informed that the inference drawn so hastily and unphilosophically many years ago, by some experimentalists, that because galvanism or electricity applied to the not-yet dead bodies of animals causes contractions of the muscles, and even resuscitates for a very brief period, and in a very imperfect degree, the flagging or torpid functions of the lungs and stomach, is long since shown to be erroneous ; and that the real explanations of the phenomena, is, that in such cases, galvanism or electricity acts simply as a stimulant, analogous to, though perhaps more powerful than friction, or the sudden application of heat or cold, or of certain chemical substances. Although the nerves going to a part or organ are cut across, yet it is well known that the nerves in the separated part, retain for a short time the capacity of being stimulated by mechanical or chemical agents ; but it is absurd to conclude that these agents are the final causes of the short-lived actions which they excite.

Moreover, is Dr. Philip not aware that his experiments, bearing on the above subjects, have been repeated, in the way directed by himself, by Müller and Dr. Dieckhof, and with results different from his ? (See Baly's Translation, vol. i, p. 550.) Is he ignorant that Breschet and Edwards,

after careful experiments, have come to the conclusion, that the restoration of the digestive process, on the application of electricity, is not owing to the electricity itself, but to the irritation of the vagus nerve; and that mechanical irritation produces precisely the same effect? (Archives Génèrales de Médecine, 1828.) If Dr. Philip is aware of these facts, how can he venture to express himself, as if the *identity* of the nervous power and electricity were still the received doctrine of physiologists? If he is *not* aware of these facts, what an amazing and culpable degree of ignorance does this circumstance imply? Yet this alleged identity of the two powers above named is asserted not once, but we should think, a dozen times, in the course of the work!

The grand discovery, to announce which the work seems to have been published, is, that a certain hepatic (Dr. Philip writes it hypatic,) affection, named by the author, the distended liver, is a frequent disorder, and, through the medium of what Dr. Philip calls " a fret of nerves," leads to a formidable and often fatal debility of the brain and spinal cord; the second and third stages of the distended liver corresponding with the first and second of debility of the brain and spinal marrow. We do not find, on a sufficient inspection, of this part of the volume, anything materially new, either as regards diagnosis or treatment. In these respects, the present work seems, to a great extent, but a *rifacimento* of the information contained in the author's Treatise on Indigestion. Here, as there, his pathological views are limited to the consideration of one only of the multifarious forms of affection, to which the organ he is treating of is subject. As in his Treatise on Indigestion, an inflammatory affection of the pyloric end of the stomach is, were we to credit Dr. Philip, the sole source of all dyspepsia; (disorders of the function of innervation, &c. being wholly overlooked, as well as those forms of derangement arising from sympathy with other organs, as the brain, &c.;) so, in the treatise before us, the manifold disorders, incident to the liver, from the fact of its being an excretory organ, from its often acting supplementary of the lungs and skin, &c., are neglected to be even adverted to. In regard to treatment, Dr. Philip here, as in his former work already alluded to, directs small doses of mercury, (1-20th of a grain of calomel,) and advises a seton, which, if we remember aright, he does not make mention of in his former treatise. This seton is to be placed over the region of the liver. As regards other internal means, he recommends hyoscyamus and the extract of poppy as the best sedative in cases of distended liver, and creosote (?) as the best tonic.

Nearly the last half of the work is occupied with another reprint of the papers from the Philosophical Transactions, which we have had so often before! We cannot conclude this notice, without animadverting to the fact of the total non-reference by Dr. Philip to contemporary labourers in the same department of pathology, namely, dyspeptic disease. No allusion whatever is made in the volume before us, to the works of Drs. Paris, Johnstone, Combe, Dick, Langston Parker, &c.: yet in one or other of these, is contained all the useful information to be found in Dr. Philip's work, with a great deal not to be found there.

Art. XX.

Practical Observations on Midwifery, with Cases in illustration. By
JOHN RAMSBOTHAM, M.D. &c. &c. Second Edition, revised.—*London,*
1842.   8vo, pp. 496.

THE work now before us is a second and revised edition of a treatise
originally published in two parts in 1821 and 1832, condensed into one
volume, partly by a diminution in the size of the type, and partly by the
introduction of fewer cases.   The very nature of the work precludes the
possibility of a lengthened analysis.   We must, therefore, limit ourselves
to a general notice of the contents of the volume, and some of Dr.
Ramsbotham's opinions upon points of practical importance.   And first,
of the ergot of rye.   " For a length of time" Dr. Ramsbotham continued
sceptical as to the active powers of the ergot, but he is now ready to ac-
knowledge and duly to appreciate its influence.   Yet even now he has
his doubts, upon a general principle, whether its introduction ought to
be hailed as a boon or reprobated as an evil.   He fears, in short, and no
doubt with good reason, that this agent is very likely to be employed
when interference of any kind is unnecessary.   The same apprehensions,
however, might fairly be expressed with respect to all medical or surgical
means.   In bad hands the best of remedies may be mischievous.   The
introductory observations on the act of childbirth, and the chapter on
natural labour, are clear and concise, and well worth the perusal of the
midwifery student.

Upon the oft-disputed point of the muscularity of the uterus, Dr.
Ramsbotham states, " that however authors may write and teachers may
talk about the uterine muscles, no such structure is evident to *my* senses.
Even the able disquisition of Sir Charles Bell, (Med. Chir. Trans., vol. iv.)
on the muscularity of the uterus, does not convince my mind on that
subject."   Upon this physiological rather than practical question, Dr.
Ramsbotham's arguments are plausible.   Upon the whole it appears to
us that Velpeau takes a fair and satisfactory view of the subject, and he
concludes " that it is during pregnancy that we must study the tissue of
the uterus for the purpose of determining its nature.   It is then only that
it is red, and contractile, and fibrous ; that it contains a large proportion
of fibrine, and that it presents, in a word, every character of the best de-
veloped muscular tissue."[*]   If Dr. Ramsbotham is correct in asserting that
" certainly the examination of the uterus in the different classes of brute
animals throws no light on the doctrine of muscularity," (p. 5,) Dr.
W. Hunter was wrong ; for he says, " in the quadruped, the cat particu-
larly and the rabbit, the muscular action, or the peristaltic motion of the
uterus, is as evidently seen as that of the intestines, when the animal is
opened immediately after death."[†]

The practical comments on and the causes of adhesion of the placenta
are very instructive.   We quite agree with Dewees, who published an
American edition of Dr. Ramsbotham's work as it first appeared, " that
by an obedience to the precepts inculcated in this chapter, even a young
practitioner may conduct these truly perilous cases to a happy issue ; by
a neglect of them, an old one may have his victims."   Notwithstanding
the care with which every writer, and we hope every teacher, on mid-
wifery discusses and details the management of adhesion of the placenta,

[*] Traité de l'Art des Accouchemens, 1835, tome i. p. 85.
[†] Anatomical Description of the Gravid Uterus, 1794, p. 26.

it is quite lamentable to reflect upon the daily malpractice exhibited in such instances.

The observations and cases of " retention and disruption of the placenta," and on " relaxation of the uterus after delivery," even after it has seemed to the hand to have acquired a considerable share of contraction and of diminution in size, are equally deserving of attention. In cases of protracted labour, Dr. Ramsbotham objects to the employment of opiates, which are advised by many to relax the rigidity of the soft parts. " Their effects are at the best uncertain, nor do I suppose that they have any tendency to produce relaxation of parts. In large doses they may procure ease from pain, but they also bring about a cessation of uterine action, the return of which is not under control, nor to be ensured at pleasure." (p. 130.) We have several times known the use of the forceps rendered necessary by the injudicious exhibition of opiates during labour, from the complete uterine torpidity that was produced. Many excellent and instructive cases are related of the protraction of labour from various degrees of pelvic deformity and other causes.

The rules that Dr. Ramsbotham lays down for the management of breast and shoulder presentations do not materially differ from those of other writers. In those cases in which turning has been previously but unsuccessfully attempted, " large doses of opiates have been advised, and sometimes administered, with the intention of diminishing uterine power;" of removing some part of that contraction which resists the admission of the hand ; but generally without any apparent advantage.

In uterine hemorrhage of the accidental kind, Dr. Ramsbotham strongly advocates the efficacy of rupturing the membranes, and he answers, in our opinion very satisfactorily, the objections that a few writers have urged against the practice. The circumstances which render this expedient necessary are carefully mentioned. Very prudent cautions, too, are given as to the external use of cold. All are probably aware that this is a powerful means of arresting uterine hemorrhage, but many are not aware, —we speak from personal observation—that its employment requires great care.

" But the external use of cold, whether in the form of iced fluids, or of solid ice enveloped in a bladder, requires, in my opinion, considerable discretion, especially under a state of exhaustion. I have found in most cases its temporary application more beneficial than a regular perseverance in its use for a length of time. I therefore generally recommend that it should be applied for a given time, that it should be withdrawn for an equal time, and that it should be repeated ; that a natural warmth may take place in the intervals." (p. 272.)

From the brief and slight manner in which Dr. Ramsbotham mentions the use of the plug in uterine hemorrhage, either accidental or unavoidable, we infer that he has but little confidence in its employment. We think, however, that Burns and many other writers have clearly proved the safety and efficacy of this mode of practice in appropriate cases.

The chapters on puerperal convulsions, plural births, abortion, and rupture of the uterus, contain abundant matter that is well worth the attention of the student and young practitioner. Upon the subject of polypus of the uterus, Dr. Ramsbotham must permit us to observe, that the safety of excision, and its general superiority to the ligature, is now almost universally acknowledged by the most experienced surgeons of this and other countries. We have before commented upon this subject.*

* British and Foreign Medical Review, July, 1837, p. 183.

ART. XXI.

1. *Remarks on Medical Reform, in a Letter addressed to the Right Hon. Sir James Graham, Bart., one of Her Majesty's Principal Secretaries of State, &c.* By Sir JAMES CLARK, Bart., M.D. F.R.S., Physician to the Queen and the Prince Albert.—*London*, June, 1842. 8vo, pp. 30.

2. *Remarks on Medical Reform, in a Second Letter addressed to Sir James Graham, &c.* By Sir JAMES CLARK, Bart., M.D. F.R.S. &c.— *London*, March, 1843.   8vo, pp. 42.

SIR JAMES CLARK has always been the strenuous and consistent advocate of Medical Reform ; and, in all his writings on this subject, he has dwelt especially on the importance of improving the education of medical men, as the fundamental principle of all rational change.   He is indeed a strong advocate for corporate reform, also, and the remodelling the existing institutions, so as to make them accessible to the great body of medical men, and not to a class only ; but these measures he regards as secondary to that individual vital reform, which consists in improving and enlarging the minds of those who are to constitute the future members of the profession. So early as the years 1822 and 1823, we find Sir James advocating the cause of medical education and, at the same time, defending the mode of teaching in his *alma mater*, and English medical literature generally, against the attacks of Tommasini, in his Letters published at Rome, and addressed to that celebrated professor in his own language.* And at a subsequent period we find him endeavouring to improve the very school he had defended, by pointing out the advantages it would derive from adopting some of the foreign modes of instruction, the value of which his travels and long sojourn on the continent had enabled him to appreciate.†   It will not be supposed, therefore, that the measures of reform, proposed or advocated by our author, are either visionary or lightly considered.   They are well worthy the attention of the profession ; and we hope they will receive mature consideration from the statesman to whom they are especially addressed.

In the first of the pamphlets now before us, that published last year, Sir James Clark pressed upon the attention of the Home Secretary, the especial claims the general practitioner had to be considered in any legislative enactment for improving the profession ; he showed " that the establishment of a good and uniform system of education, applicable to all candidates for licences to practise, was the primary object to be kept in view in any scheme of Medical Reform." He recommended " the union of the Colleges of Physicians and Surgeons, in order to embrace in one great corporate institution all the members of the profession." He pointed out how "this union might be effected without disturbing the distinctions and grades which are recognized in the profession, whilst it could not fail

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* Lettera di Giacomo Clark, M.D. al. ch. sig. Prof. Tommasini intorno alle sue osservazioni sulla scuola medico-clinica di Edinburgo—Roma, 1822.

Lettera del dottore Giacomo Clark al. Prof. Giacomo Tommasini intorno alla Letteratura medico Inglese.—Roma, 1823.

† Observations on the System of Teaching Clinical Medicine in the University of Edinburgh, with Suggestions for its Improvement.—London, 1827. 8vo.

to raise the character of medical practitioners generally, promote harmony among them, and advance the cause of medical science." He expressed his " belief that the continuance of the Apothecaries' Company would be injurious to the profession, and that the practice of pharmacy ought to be separated from that of medicine;" and he predicted " that little per-nent advantage could result to the present Colleges from any change in their constitution, which had not for its direct aim and object the good of the whole profession."

He says that the principal object he has in view in addressing the Home Secretary on the present occasion, " is to urge the necessity of so framing the legislative enactment which he is about to introduce, as thereby to secure to all who are permitted to engage in the practice of medicine a GOOD EDUCATION. This (the author truly adds,) is unquestionably the most important part of what is implied by Medical Reform, and that call-ing most loudly for the interference of the legislature. Until it is ob-tained, any scheme of reforming or modifying the existing medical cor-porations will be productive of little benefit to the profession, and less to the public."

To enable Sir James Graham fully to understand the subject on which he is about to legislate, Sir James Clark takes a review of the history of the profession during the last fifty years, and then delineates " the actual state and relative position of medical practitioners in this country." In this survey he shows how the apothecary " from being the humble indi-vidual whose duty it was implicitly to follow the directions of the phy-sician, and compound the drugs which he prescribed, has gradually risen to be the ordinary medical attendant of the great bulk of the population; and, for the most part, is now only required to summon the physician to his aid in cases of difficulty or danger;" and he justly asks, " Ought any man to be intrusted with such duties who has not brought a well-in-structed and disciplined mind to the study of a profession involving such vital interests? And is it not the duty of the legislature to take care that no man shall be licensed to undertake these duties without having ad-duced proofs of being qualified to perform them?"

Notwithstanding the great improvement in the education and position of the general practitioner, Sir James Clark considers his education to be still very defective, " more especially in its preliminary or general part;" and he says that it is " to bring his education up to the standard of his responsibilities," that legislative interference is now especially required. He considers fully all the objections that have been advanced against im-proving the preliminary education of the general practitioner, and shows, in our opinion, the perfect futility of the whole. To enable students to compass this superior education, he advocates, of course, the abolishment of the degrading system of apprenticeships, and agrees with Sir Benjamin Brodie in the propriety of raising the age at which the licence to practise is obtainable. Sir James Clark considers it essential, in opposition to the opinion of many, that " the general or preliminary instruction should be completed before the professional education commences;" and here we think he is obviously right; for the very object of the preliminary education is the fixing of a basis on which professional knowledge can be erected. The student, of course, may if he pleases, continue—and it is to be hoped that he will continue—to prosecute his more general

along with his strictly professional studies; but the time requisite for the latter must not be encroached on by the former.

Our space does not permit us to enter upon the consideration of various other points treated of in Sir James Clark's Letter; but we feel assured that if the measure about to be introduced by Sir James Graham, does not embrace the main features advocated in it, the profession will have little occasion to be satisfied with the new arrangement.   But we confess that for our parts, we have little fear on the subject.   It is impossible that the general practitioner can be overlooked in any measure intended to improve the medical profession ; to do so were indeed to play Hamlet with the part of Hamlet left out.   We think it equally unlikely that the Colleges of Physicians and Surgeons can be put on a new footing, without the abolition of their present exclusiveness and irresponsibility ; and if there is to be constituted, as we are informed, a Central Board of Control for the regulation of medical education, and the establishment of tribunals for testing the proficiency of candidates, we have too much faith in the power of publicity and of the press, to doubt, that the regulations thence emanating for the government of the profession in its new condition, will be such as are in unison with the liberal spirit of the times, and can be cheerfully submitted to by the enlightened cultivators and professors of a science and art second to none in dignity and usefulness.

Art. XXII.

Elements of Chemical Analysis, Inorganic and Organic.   By Edward
   A. Parnell, Chemical Assistant at University College, London.—
   London, 1842.   8vo, pp. 309.

The appearance, nearly at the same time, of three most valuable systematic treatises on Chemistry,—those of Professor Graham and Dr. Kane, and the new edition of Dr. Turner's, (edited by Dr. Gregory and Professor Liebig, and really almost a new work,) is an indication that industry and zeal in the prosecution of this science are not now confined to the continent, but that Britain is likely to take its fair share in the labour.   The recent completion of the last of these works will probably induce us, at no distant period, to offer our readers such an account of them as may guide them in their choice ; and to put them in possession, as we endeavoured to do on a former occasion, of the general outlines of the progress of the science during the preceding two or three years. That we are still far behind our continental neighbours in analytic chemistry cannot be doubted ; and, independently of other causes, we think that this backwardness may be traced to the want of a good elementary treatise on the subject, which might serve as a safe and sure guide to the young chemist, when entering its difficult and perplexing path.   We are not aware that any original treatise on the subject has ever been produced in England ; or that any translated works exist in our language, save Rose's Handbuch and Liebig's pamphlet on Organic Analysis. The translation of the former work is now almost out of date, being from one of its early editions ; and the work itself is much more fitted for the proficient than the learner, from the want of practical information as to the manipulations of the laboratory, and from the minuteness with which the

various processes and reactions are discussed. The latter, from its limited object, is obviously not adapted to supply the deficiency.

We are quite disposed, therefore, to welcome Mr. Parnell's treatise as a valuable addition to our scientific literature, abundant as it may already seem to be ; and we feel confident that it will speedily make its way with the public.   The work is divided into four chapters, or rather books: the first treating of " manipulations and reagents;" the second of the " *behaviour* of substances with reagents;" the third of "qualitative analysis;" and the fourth of " quantitative analysis."

In the first chapter we find a general account of the *kind* of processes which the analyst has to perform, the apparatus required, and the chief precautions to be observed in the use of it ; this part, which is illustrated by woodcuts, might, we think, have been extended with advantage. Next follows a section containing notices of the chief tests on reagents employed, and the means for ascertaining their purity.

The details of the second part are arranged in a tabular form, which has the advantage of exhibiting them in the state of greatest compression, and one that admits of the easiest reference.   The third part consists of the application of these in qualitative analysis, with directions and examples ; and it also includes an account of the use of the blowpipe, of the analysis of mineral waters, urine, and urinary calculi, and of the detection of poisons in organic mixtures. The " behaviour" of the various substances under the blowpipe is set forth in tables like those of the second part.   We think some portions of this division too much condensed, and others decidedly meager.   Thus the qualitative analysis of urine and the discrimination of urinary calculi are discussed in less than three pages ; and these are but an abridgment of the directions given by Berzelius, which are much behind the present state of knowledge of this subject.   Thus all that is said of the detection of albumen is comprised in the following sentence : " Nitric acid gives a floccy [flocky] white precipitate with albumen, which is soluble in caustic potash after being washed, and is not reprecipitated by acetic acid."   In the fourth part, on quantitative analysis, it strikes us that a very large proportion is bestowed upon mineral substances; and that the section on organic analysis is very meager.   The instructions contained in an elementary work of this kind should be not only directions as to the processes to be performed, but intimations of the numerous sources of error by which the results may be disturbed, and of the mode of guarding against these. For such we look in vain in the work before us; and we would suggest to the author to extend, in the future edition which we doubt not will soon be required, those portions of the work that are of peculiar importance to the physiologist, the toxicologist, and the physician, and to make the directions for each process as simple, comprehensive, and independent as possible.   We doubt not that there are many young practitioners, who would be glad to employ some of their leisure hours in such investigations, when provided with such an intelligent guide as we think Mr. Parnell might easily afford them.

As we are not chemists by profession we shall not enter into any examination of the details of this work ; the general accuracy of which is secured by the author's position at University College, and by the supervision of the illustrious Professor to whom it is inscribed.

Art. XXIII.

1. *Outlines of Pathology and Practice of Medicine.* By W. P. Alison, m.d. f.r.s.e., Professor of the Practice of Medicine in the University of Edinburgh. Parts I. II.—*Preliminary Observations: Inflammatory and Febrile Diseases.—Edinburgh,* 1843. 8vo, pp. 499.

2. *Methodus Medendi; or the Description and Treatment of the principal Diseases incident to the Human Frame.* By H. M'Cormac, m.d. Professor of Medicine in the Royal Belfast Institution.—*London,* 1842. 8vo, pp. 574.

Although the work of Dr. Alison is intended as a text-book for students attending his lectures, it is calculated to fulfil much greater objects, being, in fact, according to its extent, the best digested and most philosophical manual of the practice of medicine which has appeared for many years,—we were almost going to say, since the publication of the admirable "First Lines" of Dr. Alison's greatest predecessor. If there is one man in the profession better qualified than any other to write such a work, we think Dr. Alison is that man. He has been long acknowledged by all who know him to be in his character a pattern of a scientific physician; and his opportunities—we may say the necessities of his position—have been such as to improve his natural capacities to the utmost. The public offices which he has so long filled have demanded and fostered alike scientific knowledge and practical skill. The consequence is, that, to an exact and extensive acquaintance with what has been discovered and done by others in all branches of medicine, Dr. Alison adds the skill and tact which can only be acquired by long and diligent attention to the treatment of disease in an extensive field of practice. It would, however, be doing injustice to its author to regard the present work as intended to convey to the profession a full view of the results of his medical experience: it ought rather to be viewed as a concession to the necessities of his pupils; or, at most, as a specimen of the treasures yet in store for us. The nature of the volume is justly expressed in the preface:

" In attempting to compress, within the limits of a text-book for lectures, the facts which seem to me best ascertained in regard to the nature, progress, and symptoms of diseases, and the effects of remedies upon them, it has been my object to simplify, as far as possible, both the diagnostic marks of diseases, and the practical rules for their treatment, dwelling only upon those, an accurate knowledge of which may be acquired without much difficulty, and on which it has appeared to me, in practice, that we can rely with most confidence. I have endeavoured to connect these practical rules and directions with as full a statement as the limits of such a work will permit, of the grounds of those opinions, in regard to the causes, the intimate nature, and fatal tendency of diseases, which seem to me, in the present state of our knowledge, to be supported by the best evidence; because, notwithstanding all that has been said, and may be said, against medical speculation, I am fully convinced of the truth of the observation of Dr. Cullen, that ' at all times the practice of medicine has been, and still is, with every person, founded more or less upon certain principles established by reasoning;' from which it evidently follows, that any one

who undertakes to teach the practice of medicine must be prepared to explain the grounds of his opinions; as well as to state the facts, and describe the appearances, on which he is to found his practical precepts."

Everywhere the work exhibits the author's exact information as to the discoveries of others, his just appreciation of contending claims, his cool judgment in weighing the truth, and his own practical knowledge of the treatment of the diseases. There is a cautious sobriety pervading it which commends itself to those who have experienced, in sick rooms, the difficulty and uncertainty of our art, and which cannot fail to be valuable to younger minds whose zeal and hope are apt to carry them beyond the narrow bounds which limit our capabilities; it will help to teach them beforehand, a lesson which they must otherwise learn by experience, that in the art of medicine, the meed of successful practice is rarely won by genius or learning alone, and almost always by sound common sense, a cool and sober judgment, and diligent observation. The chapter on the Treatment of Fever is admirably characteristic of the author's knowledge and discretion.

The *Methodus Medendi* is the very antithesis of Dr. Alison's work. Dr. M'Cormac has a huge appetite, but not a corresponding digestion. He must be a vast reader, a very *helluo librorum*—but, notwithstanding his title, without *method*. Anything like order or arrangement hardly exists; one fact, or opinion, or observation, follows another in rapid succession, with the loosest possible connexion; the author appearing to delight in giving his mind the free rein with little check as to speed or direction. And yet the book is a full book and a learned book. You cannot read a chapter of it and doubt that Dr. M'Cormac is thoroughly aware of all that has been written upon the subject of it; and you see that he gives in short compass the condensed result of his multifarious reading: but there is chaff as well as grain, and the grain is nowhere winnowed clean. The author has not sufficiently selected, nor weighed, nor judged the mass of facts and opinions he has collected. We cannot therefore recommend the *Methodus Medendi* to the student or young practitioner; they would be constantly puzzled and perplexed by it, if not positively led astray. But the work of Dr. M'Cormac will be most acceptable and valuable to that numerous class of readers, who have at one time been diligent students, and who would often, when a difficult case puzzles them, willingly open some book which could recall what they had forgotten, or give them a short statement of a mass of facts on which they may exercise their own reasoning and judgments; to them, accordingly, we recommend it.

PART SECOND.

Bibliographical Notices.

Art. I.—*The Connexion between Physiology and Intellectual Philosophy*. By the Rev. JOHN BARLOW, M.A. F.R.S. F.L.S. &c. &c.— *London*, 1842. 12mo, pp. 64.

This unpretending little treatise, the substance of which was communicated to the members of the Royal Institution at one of their Friday evening meetings, contains the best general views of its subject that we have anywhere met with. The author has drawn his materials from the writings of physiologists of the highest repute; and shows himself quite *au courant* with their most recent investigations. These materials have been combined, by his own intelligent and highly-cultivated mind, into a form alike pleasing and instructive; so that this lecture may be perused with profit, as we are sure it will be with interest, by the professional as well as the general reader. The severe style of a grave philosophical treatise, the object of which is to prove rather than to illustrate the positions which the author lays down, is too apt to degenerate into a dry repulsiveness, injurious to the spread of truth, as well as to the appreciation of the labours of the writer; and we think that many an author (ourselves included) may take an instructive lesson from Mr. Barlow, as to the union of the graces of style with the solidity of true philosophy. We offer the following as examples. After pointing out the most important differences between the cerebral organization of man and that of the highest among brutes, he thus proceeds to illustrate the superiority of his governing *will*, to the instinctive impulses which he shares with the lower animals:

"The first instinctive impulse is to preserve life. Look at a wrecked vessel! There is one man there, ordering and directing all on board: the only remaining boat is lowered; he is careful to see it filled with the persons crowded about him, it pushes off, and where is he? He is there on the deck of that sinking ship; the boat would not hold *all*, and he has refused a place in it, and remained to perish, rather than sacrifice one life committed to his charge. He knows that death awaits him: he has been urged to save himself: and yet he is there! What is the impulse which prompts him thus to contravene the first great law of animated nature?

"Sleep, again, is among our most imperious needs, for the want of it gradually destroys life. There lies a sick man in his bed, senseless, in the last stage of an infectious fever: and there is one watching beside him, looking pale and exhausted, but who sleeps not, stirs not, though her young life is wasting away with fatigue, and exposed to contagion: and she knows it, and has calculated that the same grave will receive both. What nerve of all that fine machinery has impelled her to this course?

"Look at the astronomer in his observatory! The night is far advanced and he is chilled and fatigued; yet he remains with his eye at the telescope—for what? To carry on a series of observations, which perhaps in two generations

more may give as its result the knowledge of some great law of the material universe: but he will be in his grave long ere he can expect that it will be ascertained. He sits down to his calculations, and he forgets his meals, sees nothing, hears nothing, till his problem is solved! No sense prompts him to this sacrifice of rest and comfort. But do we call these persons insane? No—we honour them as the excellent of the earth; admire their lives, and wish that, when the occasion comes, we may have courage so to die.

"I know of but one solution of the difficulty; there must be some element in man which we have not yet taken account of; some untiring, undying energy, which eludes, indeed, the fingers and the microscope of the anatomist, but which exercises a despotic sway over the animal mechanism, and takes possession of it for its own use, to the point of exhausting and finally destroying it.

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"If we look through nature, we shall find that the happiness of the organized being consists in the accomplishment of its end of existence. Animals while supplied with food and propagating their kind, are happy: their span of life is long enough for all the enjoyments they require; but man's life is insufficient for his wishes, and these gross pleasures disgust and weary him. Where is *his* happiness then? We have seen it! The captain of the wrecked vessel feels his heart swell with proud delight, as he awaits death with a consciousness of having done what, if he were an animal only, would be an act of the wildest insanity. The fair girl, before whom all the pleasures of life were smiling, despises them, and finds her joy in dying with the object of her affections, because she *feels*, even if she does not argue, that thus they will still be united. The astronomer has no greater delight than to pursue knowledge which affords him neither fame nor profit; though it be only to be gained at the expense of fatigue at any rate, and probably of health......... We have seen that all animated nature seeks the end of its being, and is happy in attaining it: if man then be akin to that Ruling Will, which both he and the universe own as Lord, the ultimate object of his existence must be alike happiness; and we can figure none to ourselves for such a being, but pure benevolence and perfect knowledge."

Illustrations, such as these, convey to most minds a stronger conception of a great principle, than the didactic enunciation of it, however clearly expressed. Those who heard the clinical lectures of Sir C. Bell, will remember how felicitously they were often introduced by him. Yet there may be danger of running into an extreme, and of making the real object subservient to an attempt at rhetorical display. Our readers will be best able to understand our idea of a good lecture upon an abstract subject, by perusing the one from which we have quoted these specimens.

Art. II.—*The Hunterian Oration delivered at the Royal College of Surgeons in London, on the* 14*th of February,* 1843. By J. M. Arnott, Surgeon to the Middlesex Hospital.—*London,* 1843. 8vo, pp. 37.

This is an excellent oration. Besides containing some interesting observations on the prescribed and inexhaustible theme of these annual discourses, John Hunter,—it gives the best account yet published of the life and labours of Sir Charles Bell, and also some interesting particulars of Baron Larrey. The materials are clearly digested,—the style is good, and the whole production is creditable to Mr. Arnott as a surgeon and a scholar.

ART. III.—*The Physiological Anatomy and Physiology of Man.* By ROBERT B. TODD, M.D. F.R.S., Professor of Physiology in King's College, London ; and WILLIAM BOWMAN, F.R.S., Demonstrator of Anatomy in King's College, London. Part I. with Fifty-one Wood Engravings.—*London*, 1843. 8vo, pp. 200.

THE plan of the present treatise is in many respects new ; and we believe it to be admirably adapted to meet an existing want. Its design is, to afford to the student and practitioner a plain and accurate view of the intimate structure and functions of the human body ; and its arrangement corresponds with that which is adopted in the physiological course at King's College. All the subjects have been wrought out anew by the authors conjointly, and the work is the product of their united labours. The reputation of Dr. Todd as an able and successful teacher of physiology, and that of Mr. Bowman as an accomplished microscopist, afford a guarantee that their projected treatise will be executed in a manner worthy of the subject ; and our examination of the portion already published has fully satisfied us of its value. We are not certain, however, that it can be rightly called a treatise on physiology ; since, in that science, the *function* and its conditions are the objects of inquiry, and the *organ* is considered merely as subservient to it. Thus in discussing the respiratory function, the physiologist has to include the skin as well as the lungs, and must also explain the mechanism by which the respiratory movements are effected. In the work before us, the *organology* is the prominent part, and the physiology is generally made subservient to it. Hence we think the first part of the title more appropriate than the second ; and as a Treatise on Physiological Anatomy,—not superseding the various systems of physiology at present in use, but to be read in conjunction with them or rather before them, we strongly recommend this work to the attention of our readers. It seems to us to contain exactly what the student ought to know on every subject discussed in it ; and the descriptions are so clear, and the illustrations so complete, as to leave nothing to wish for. This first part contains, after an introductory chapter on Life and Organization, a general account of the solid and fluid constituents of the body, a description of the various minute movements occurring in its interior, and a detailed examination of the tissues classed under the head of " passive and active organs of locomotion," including the fibrous, adipose, areolar, cartilaginous, osseous, serous, and muscular structures. We prefer reserving a more detailed analysis, until the whole shall have been completed.

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ART. IV.—*On the Chemical Discrimination of Vesical Calculi.* By E. SCHARLING, Prof. of Chemistry in the University of Copenhagen. Translated from the Latin, with an Appendix, by S. E. HOSKINS, M.D. With Plates.—*London*, 1842. 8vo, pp. 177.

IN our Number for April 1840 we gave a review of the original treatise of Dr. Scharling, and it was owing to our favorable judgment of it that Dr. Hoskins was led to undertake the translation now before us. In our former article we gave so full an account of the contents of Dr. Scharling's work, that we have only now to express our satisfaction that it has been

translated, and that the task of translation has fallen into such able hands as those of Dr. Hoskins. The English version is at once faithful and elegant, the style having all the characters of an original composition. We have therefore no hesitation in saying that, with the excellent drawings of calculi with which it is illustrated, it is the most useful work on the subject, for a student or young practitioner, which we have in the English language.

Art. V.—*Chemical Manipulation; being Instructions to Students in Chemistry on the Methods of performing Experiments of Demonstration or Research, with Accuracy and Success.* By Michael Faraday, d.c.l. f.r.s. &c. &c. Third Edition.—*London,* 1842. 8vo, pp. 664.

Our purpose in noticing this important work, is rather to direct the attention of our readers to the fact of its republication, than to express any opinion of its value. For the testimony of the whole scientific world in its favour, putting aside the well-known qualifications of its illustrious author, is a far higher tribute to its merits, than any commendation of ours could be. In first undertaking this work, Mr. Faraday must have been influenced by the simple desire for the promotion of science, by smoothing the practical difficulties in the way of the beginner. He could not expect that the work would add much to his reputation ; nor could he anticipate from it such an amount of pecuniary gain, as should be anything like an adequate compensation for his labour. Highly, therefore, as we have other reasons to think of him as a philosopher, we have found, in the production of this volume, much to increase our admiration of him as a man. To see the pupil and successor of Davy, himself no less illustrious either as a discoverer or expounder of scientific truth, condescending to instruct the tyro in the simplest process of the laboratory, or to explain the newest discoveries in almost any branch of science to an audience of which only a few can be supposed capable of really appreciating them, bespeaks a mind in which the highest talents are united, (would that the combination were less rare,) with the purest and simplest morality.

The present edition of the Chemical Manipulation is little else than a republication of the second, which had been out of print for several years, induced by the continual inquiries made for it. His other avocations, and (as we regret to learn,) his uncertain health, have prevented Mr. Faraday from introducing those changes which the progress of time and of chemical science might seem to make necessary. But, as he justly remarks, however much he might add to the book, he could not take much out : and the various branches of analysis, especially that of organic substances, should rather be treated separately and fully, than slightly hinted at in a preparatory work like the present.

To all who are making the study of chemical science an express object of their pursuit, this volume will afford, we hesitate not to say, that kind of assistance which can only be otherwise obtained by the constant direction and supervention of an accomplished master. It is, in fact, the teaching of Professor Faraday in the Laboratory of the Royal Institution.

Art. VI.—*The Causes, Nature, Diagnosis, and Treatment of Acute Hydrocephalus.* By J. R. Bennett, m.d.—*London,* 1843. 8vo, pp. 254.

This work is the essay to which the Fothergillian gold medal was awarded by the London Medical Society ; and it is well deserving a yet higher meed : it is a most excellent prize essay. The author displays an extensive acquaintance with the writings of his predecessors, whose opinions are always stated clearly and with candour, while his own are expressed with modesty. As a good digest of what is already known on the subject of hydrocephalus we can conscientiously recommend the essay to our readers, and would especially call their attention to the chapter on the statistics of the disease, which contains much valuable information on points which we do not recollect to have seen noticed in any English work on the subject. The statistics occupy the second chapter of the work ; the first is devoted to a detail of the symptoms of hydrocephalus ; the third, to a description of the post-mortem appearances ; and the causes, nature, diagnosis, and treatment are discussed in successive chapters. All are evidently the production of a well-informed writer, and able physician ; but in all we miss that impress of vitality which personal observation only can impart to a description of natural phenomena. There is, too, a constant use of the vague expressions *some, many, often,* which, when subjects are treated of that admit of being exhibited by numbers, is at the present day scarcely excusable. For this defect we were at a loss to account, until we found, at p. 92, that the number of post-mortem examinations made by Dr. Bennett was only ten ; and from p. 62, it further appears probable that they are all the cases of which he has preserved notes. Now this may be all very well for a paper submitted to the council of the Medical Society, but when it meets us in a printed book we must criticise it. Our knowledge of a disease, confessedly so obscure, to the investigation of which men of great talent have devoted much time and labour, and have yet left many points in its pathology and treatment undetermined, is not likely to be promoted by a compilation, however well executed, of what is already familiar to the profession.

It is with no unfriendly spirit to Dr. Bennett that we make these observations, but because we are sure that if he will devote himself to the search " for truth in Truth's own book," and not content himself with being the copyist of others, he possesses every requisite for becoming a most successful cultivator of our art. We hope before long again to meet with him in the character of an independent observer. For the present, we wish him good speed, commending to his notice an apophthegm of one whose memory, we doubt not, he joins with us in revering, " Was sich im Umgang der Natur und in ihrem Anschauen entwickelt, hat mehr Werth als alles Erdachte oder Erlernte. Das allein hat nur wahres Leben, d. h. den Geist der Natur, und ist so ewig wahr wie sie."

ART. VII.—1. *A Practical Treatise on Pulmonary Consumption, its Pathology, Diagnosis, and Treatment, &c.* By FRANCIS COOK, M.D. M.R.C.S.E.— *London,* 1842. 8vo, pp. 118.

2. *An Exposition of the Pathology and Treatment of Tubercular Phthisis.* By SAMUEL FLOOD, M.R.C.S.— *London,* 1842. 12mo, pp. 82.

WE had recently occasion to notice in terms of censure, a work professedly descriptive of consumption ; and we have now evidence before us that the desire of acquiring a small notoriety in connexion with that disease, possesses more than one person whose qualifications scarcely average those of moderately intelligent students. Where this sudden passion for tacking together worn-out platitudes, or painfully absurd novelties on the subject of phthisis, is to end, we cannot pretend to determine ; and indeed judging from late experience, we may presume that a volume on consumption may be looked forward to by those interested in the progress of the exact sciences, as an event destined to occur quarterly.

But this matter grows too serious to be treated triflingly. For, though we are unwilling to acquiesce in the common notion that the learned writers produce these books with the simple view of advertising themselves, and for our own parts feel contented to regard them as the offspring solely of a somewhat impertinent vanity, yet productions of the sort are not as harmless as they might appear. They in truth lend their little aid in supporting and giving vigour to the monstrous system of fraud practised by the " consumption-curing" doctors on the too gullible multitude. Viewed in this aspect they are mischievous in the extreme ; though redolent of the very refuse of Paternoster Row, their influence upon the sufferers from consumption will not be the less active. Though utterly destitute of logic, as of evidence of even moderate acquaintance on the part of the writers with the principles of precise medicine, they will not fail, because they hold out hopes of cure, to lure many a victim to the toils set for all whose pockets are sufficiently well lined to make them worth the catching.

With these general observations we dismiss the two works now before us ; we will not waste the time of our readers or our own, in attempting to expose their inanities. They contain not a single novelty of the least conceivable value ; but they abound with old errors, and silly suggestions both old and new.

ART. VIII.—*A New Theory and Treatment of Disease, founded on Natural Principles.* By JOHN TINNION, M.D. AYR.— *Edinburgh,* 1843. 8vo, pp. 35.

AT last, we verily believe, folly and absurdity in medical literature have reached their acmè, in the production now before us. If Ayr really and truly claims the author of this pamphlet among its citizens, then Ayr, we hesitate not to say, can boast of an unparalleled blockhead ; and the college which dubbed John Tinnion an M.D., deserves to be disfranchised. But the thing is altogether so wretched that we are disposed to believe that the whole is a hoax got up by some wag to ridicule the profession. If so, the attempt must fail, from the unmitigated dulness of a joke that drags its slow length along three dozen mortal pages.

ART. IX.—*Elements of Electro-Metallurgy.* By ALFRED SMEE, F.R.S., Surgeon to the Bank of England, &c. &c. Second Edition, revised, corrected, considerably enlarged, illustrated with Electrotypes and numerous Woodcuts.—*London,* 1843. 8vo, pp. 338.

WE certainly live in such an age of scientific novelties as none have ever witnessed before. And these novelties are not of abstract or speculative interest alone; but are brought into practical employment, supplying desiderata, of which scarcely any but the dreamy speculator, or the ingenious romancer, ever contemplated the advent. There is scarcely one of the famous Century of Inventions soberly put forth by the Marquess of Worcester two centuries ago, or of the speculations on which the philosophers of Laputa were represented, by the biting satirist of the last age, as absurdly engaged, which is not now realized. The locomotive engine, and the electric telegraph almost annihilate time and space in terrestrial communication. We are promised a means of aerial communication (which, as we are gravely assured, only waits the completion of certain legal operations, to be carried into effect on an extensive scale) fully as certain and speedy,—touching which we maintain for the present a philosophic incredulity. We have learned the art of transforming the fleeting shadow into the permanent lights and shades of the most perfect drawing. And by the art, which Mr. Smee has done much to advance, and of the present state of which the work before us gives a full and highly interesting account, the most perfect and durable facsimile may be obtained of any highly-wrought surface, without the least injury to the original. It is a remarkable instance of the value of an *idea,* that the deposition of metallic copper, in that form of the voltaic battery, known as Professor Daniell's, was known for some time to take place, in such a manner as to produce a complete counterpart, even to the minutest scratch, of the surface on which it takes place, before there was any thought of applying it to practical purposes. The idea occurred, we believe, about the same time to Professor Jacobi, of St. Petersburg, and to Mr. Spencer, of Liverpool. Once suggested, it has been laid hold of and applied to a great variety of purposes, of which Mr. Smee's work contains a full account. To such of our readers as are desirous of keeping up that general information, which often contributes so much to the estimation and usefulness of a practitioner, we recommend the perusal of this treatise; and we need scarcely add, that those who can find time to amuse themselves with the operations it describes, will find in its pages ample guidance. The example of Mr. Smee himself shows that the zealous pursuit of such an object is not inconsistent with professional success.

ART. X.—*Thermal Comfort; or Popular Hints for Preservation against Colds, Coughs, and Consumption.* By SIR GEORGE LEFEVRE, M.D. &c. —*London,* 1843. 8vo, pp. 31.

WE are glad to perceive by the date of this pamphlet that Sir George Lefevre has finally established himself in London; and its contents prove that he is willing to let his countrymen benefit by the experience which his long residence on the continent, and especially in St. Petersburg, has enabled him to acquire. The object of this little essay is to show—

(1) that consumption is much less prevalent in Russia than in England; (2) that the cause of this is not to be sought in the peculiarity of the climate, but in the greater care taken by the inhabitants, out-of-doors and in-doors, by impenetrable clothing, impenetrable walls and windows, and everlasting stoves, to eschew cold and maintain bodily heat; and (3) that the people of England might gain the same happy ends by adopting the same means. He most happily exposes the absurdities almost universally witnessed in our houses, among the rich as well as the poor, of allowing our halls, staircases, and bedrooms to be of the temperature of the wintry blast, while our sitting-rooms are kept at summer heat. Judging from this, foreigners might well imagine, that so far from complaining of our *variable* climate, as we *invariably* do, we were so enamoured of it, that we did all we could to imitate it within doors. We have not room to notice at greater length Sir George's pamphlet, but we commend it to the notice of the profession and the public, as containing something that it interests them to know.

Art. XI.—*Report on the chief Results obtained by the use of the Microscope in the study of Human Anatomy and Physiology.* By James Paget, Demonstrator of Anatomy at St. Bartholomew's Hospital. —*London*, 1842. 8vo, pp. 51.

As this small work is merely a reprint, with additions, of a paper which appeared in our Number for July last, we only notice it here for the purpose of stating that the additions are of the same sterling value as the original text, and therefore that the Report as it now stands, must be regarded as an improved edition of the original. We believe we only echo the opinion of the best judges in saying that Mr. Paget's Report is a master-piece; evincing, in a striking manner, the author's industry, learning, and good sense, and bearing on its face the unmistakeable impress of truthfulness of statement and soundness of inference.

Art. XII.—*Interment and Disinterment; or a Further Exposition of the Practices pursued in the Metropolitan Places of Sepulture, as affecting the Health of the Living.* By S. A. Walker, Surgeon.—*London*, 1843. 8vo, pp. 28.

This is a very important addition to the author's work on Graveyards; and we regret much not having seen it until our article on Cemeteries in the present Number was printed. Mr. Walker's pamphlet contains many new facts, strikingly illustrative of the evils flowing from the barbarous practice of intra-mural sepulture, evils which, thanks to the author and his patriotic coadjutors, are now felt to be so intolerable as to command abatement. In reference to this question, ignorance and self-interestedness may continue to be blind and deaf; but we shall be content to abide by the verdict of all honest and unprejudiced men who shall read Mr. Walker's pamphlet. To such we commend it.

PART THIRD.

Original Reports and Memoirs.

CLINICAL AND PATHOLOGICAL REPORT ON THE PNEUMONIA OF CHILDREN AS IT PREVAILS AMONG THE POOR IN LONDON,

By CHARLES WEST, M.D.,

Physician to the Royal Infirmary for Children, and to the Finsbury Dispensary.

IF any person were to estimate the importance of pneumonia in early life from the space allotted to it in English works on the diseases of children, he would doubtless conclude that a malady concerning which the most experienced have thought it necessary to say so little can neither be grave in its character nor frequent in its occurrence. Our tables of mortality, however, show that pneumonia is the cause of a larger number of deaths in childhood than any other diseases, with the exception of the exanthemata. It appears from the Appendix to the Third Report of the Registrar-General, that during the year ending May 22, 1841, 22,429 persons died within the Metropolitan districts under the age of fifteen. Of these 3058, or 13·6 per cent. died of pneumonia; 2963, or 13·0 per cent. of convulsions; and 1216 or 5·4 per cent, of hydrocephalus. A very similar result is obtained by examining the returns from Manchester, Liverpool and Birmingham, which are contained in the same report. In the year 1839, 11,164 deaths took place in these three towns, of persons under the age of fifteen. Of these persons 1348 or 12 per cent. died of pneumonia, 1615 or 14·4 per cent. of convulsions, and 493 or 4·4 per cent. of hydrocephalus. The slight excess in this case of deaths from convulsions cannot be regarded as invalidating the statement made as to the extreme frequency of pneumonia; but depends doubtless on the difficulty of obtaining an accurate return of the causes of death in places where there is a large proportion of migratory population, such as the Irish in Liverpool. That this is the true explanation of the apparent excess of deaths from convulsions appears further on observing that in Birmingham where no such disturbing cause exists, and where the registers may therefore be presumed to be kept with greater accuracy, the per centage of deaths under fifteen years of age from convulsions is only 7·0, and from hydrocephalus 4·0, but from pneumonia 16·0 per cent. Even though the above returns were not completely exact, they yet must be regarded as affording a close approximation to the truth, and as establishing the serious nature as well as the frequent occurrence of inflammation of the lungs in childhood. A very large number of cases of this disease came under my notice at the Finsbury Dispensary, in the years 1841 and 1842, and at the Children's Infirmary in 1839-42, and the results of what I believe that I then learned are embodied in the following observations. For the opportunity of investigating both this and many other diseases of infancy during many years previous to my appointment to the office of physician to the Children's Infirmary, I am indebted to the great kindness of my friend and predecessor Dr. Willis ; and gladly acknowledge the extent of an obligation which I can never hope to repay.

It will probably occur to some on reading the following remarks, that a great discrepancy exists between many of the statements and opinions they contain, and those of French writers of deserved reputation. To account for this, however, it will not be necessary to impugn the accuracy of the observations of either party ; since two causes may be assigned fully adequate for its explanation. These are the very tender age of many of the infants who came under the notice of our continental neighbours ; and the extremely unfavorable hygienic conditions in which all children are placed, whether at the *Hospice des Enfans Trouvés*, or at the *Hôpital des Enfans Malades*. The investigations of Billard and Valleix were carried on at the Foundling Hospital, and consequently for the most part on children only a few days old ; while no child labouring under pneumonia who came under my notice was less than a month old. It should too be borne in mind that the morbid condition of the lungs of new-born children, which depends on their

imperfect expansion at birth, (first described under the name of atelectasis pul-
monum by Dr. E. Jörg,[*]) was unknown either to Billard or Valleix, and that even
now the French are by no means familiar with it.[†]   But the condition of those
children who are admitted into Foundling Hospitals is precisely such as most fre-
quently gives rise to this affection ; and, as Hasse[‡] has shown in his elaborate
work on Morbid Anatomy, the symptoms noticed during life, and the appearances
found after death in many of the cases described as pneumonia by French writers,
are exactly such as characterize atelectasis pulmonum.

Ample evidence exists of the extremely unfavorable conditions under which
children are placed in the Children's or Foundling Hospital at Paris.   One result
of this circumstance is shown in the endemic prevalence of diseases in those in-
stitutions such as do not exist elsewhere ; another in the frequent complication of
almost all diseases with other secondary affections.   Of these secondary affections
gastro-enteritis and pneumonia are the most frequent.   So often indeed is a con-
dition of the lungs resembling that produced by inflammation observed among the
inmates of the Foundling Hospital, that some have asserted pneumonia to be an
invariable complication of the diseases of new-born infants.[§]   The researches too
of M. Becquerel,[‖] .which were carried on at the *Hôpital des Enfans Malades*,
where none of the patients are under two years of age, discovered traces of inflam-
mation of the lungs in the bodies of 49 out of 133 children who had died of various
affections.   From these facts and some others of a like nature, M. Becquerel con-
cludes that pneumonia supervenes rarely in perfectly healthy children ; that it
occurs most frequently in those who are exhausted by previous disease, or placed
in unfavorable hygienic conditions ; and that it comes on in the course of acute
diseases of specific adynamic character.   To this opinion French writers almost
universally subscribe, and some have even denied the existence of idiopathic pneu-
monia in children between two and five years of age.[¶]   MM. Rilliet and Barthez[**]
likewise, though they do not agree to this proposition as absolutely true, yet admit
that it is subject to but very few exceptions, since they met with only 3 instances out
of 40 cases of pneumonia which occurred in children between two and five years
of age, where the patients were previously in good health.   Even between the ages
of six and fifteen, idiopathic pneumonia according to their observations is rare, 6 only
out of 20 children having been free from other disease at the time of its invasion.[††]

It may suffice to have mentioned these facts without enlarging on the different
features which disease must present among children who for the most part were
not suffering from extreme poverty, and who were tended by their parents at their
own homes, from those which it wears among the wretched inmates of the Found-
ling and Children's Hospitals at Paris.

Morbid Anatomy. I will now proceed to detail the results of my own obser-
vations ; prefacing them with a Tabular View of 37 post-mortem examinations of
children who died of pneumonia.   The appearances are arranged under the heads
of Lobar, Lobular, or Vesicular Pneumonia, according as one or the other form of
inflammation predominated.

[*] In his Dissertatio de pulmonum vitio organico — Lips. 1832 ; and afterwards more
fully in his work, Die Fötuslunge im gebornen Kinde.—Grimma, 1835.

[†] In proof of this, see a paper by M. A. Lhommeau, in Gaz. des Hôpitaux, Sept. 20,
1842, "Sur un état particulier du poumon chez un nouveau né," wherein he describes
minutely a case evidently of Atelectasis ; and notices its difference from pneumonic lung,
but is quite at a loss as to its real nature.

[‡] Specielle pathologische Anatomie.   Band i.—Leipsig, 1841, s. 324-35.

[§] See a paper by M. Savatier, in La Clinique for 1834, republished in Froriep's Notizen,
Bd. xix. No. xxi. ; also Valleix Clinique des Malad. des Enfans.—Paris, 1838. Chap. ii.

[‖] Archives Générales de Médecine, 1839, p. 437,

[¶] Gerhard, in American Journal of Medical Sciences, August and November, 1834 ;
and Rufz, Journal des Connaissances Médico-chirurgicales, 1835, p. 101.

[**] Maladies des Enfans, Aff. de Poitrine.—Paris, 1838, p. 76.

[††] Since this was written, MM. Rilliet and Barthez have published their Traité Cli-
nique et Pratique des Maladies des Enfans, and the statements contained in it show the
frequency of idiopathic pneumonia to be greater than they had formerly supposed. "Of
245 children attacked with pneumonia, 58 were previously in good health. 24 of hese
58 children were under five years old, 34 had exceeded that age." (Vol. i. p. 108.)

LOBAR PNEUMONIA.

No.	Sex.	Age yrs.	mos.	Idiopathic or Consecutive.	Seat and Stage. Right Lung.	Left Lung.	Complications. With other Affections of the Lungs.	With Affections of the Bronchi.	With Affections of the Pleura, &c.	With Tubercle.
1	M.	...	3½	Idiopathic.	Lower two thirds of lower lobe, in third stage.	Fringing lower edge of upper and whole lower lobe, in 3d stage.	Patch of lobular pneumonia in 2d stage, in centre of left upper lobe. Great vesicular emphysema of both lungs; interlobular of upper left lobe.	Contained puriform fluid. Not injected.	Slight adhesions of right pleura.	None.
2	F.	...	7	Following coryza in a phthisical child.	Upper and lower lobes in first stage.	Upper slightly in 1st, lower in 1st and partly in 2d stage.	None, other than tubercle.	Contained no secretion—quite pale.	None.	Softened tubercle of bronchial glands, extensive deposit in both lungs.
3	F.	1	1	Idiopathic.	Lower half of upper lobe in 1st, greater part of middle, and lower lobes in 3d stage.	Upper lobe in 2d and 3d, lower very far advanced in 3d stage.	Marginal vesicular emphysema of both; great interlobular emphysema, especially of right. Vesicular pneumonia in many parts of both lungs.	Very little puriform fluid. Slight congestion.	General recent adhesions on right side, slight on left.	None.
4	F.	1	2	Idiopathic.	Lower part of middle, whole lower lobe in 1st stage.	Lower half of upper, whole lower in 1st stage.	Vesicular emphysema of upper lobe of right lung. Marginal vesicular pneumonia of middle and lower lobes of right lung.	Containing a little mucus. Much congested.	None.	None.

LOBAR PNEUMONIA (CONTINUED.)

No.	Sex.	Age. yrs. mos.	Idiopathic or Consecutive.	Seat and Stage.		With other Affections of the Lung.	Complications.		With Tubercle.
				Right Lung.	Left Lung.		With Affections of the Bronchi.	With Affections of the Pleura, &c.	
5	F.	1 3	Idiopathic.	Lower two thirds of upper in 1st, middle in 2d and 3d, lower in 2d.	Lower posteriorly in 1st, its lower edge fringed with 2d stage.	Patch of vesicular emphysema at upper part of upper lobe of right lung, also diffused in left lung. Lobular pneumonia in 1st stage, of a few lobules of left upper lobe.	Containing abundant thick mucus. Not congested.	Recent adhesions on right side.	None.
6	F.	1 5	Following symptoms of gastro-enteritis.	Lower margin of upper two posterior thirds of lower in 2d, and verging on 3d stage.	Whole lower lobe in 2d, verging on 3d stage.	Intertobular emphysema of right lung, especially of anterior part of upper lobe.	A little puriform fluid. State as to congestion not mentioned.	Old adhesions on left side.	None.
7	M.	1 8	Idiopathic.	Lower lobe in 1st stage.	Lower lobe in 1st stage.	None.	A little mucus in larger bronchi. Condition in other respects not noted. Small superficial erosions on under surface of epiglottis, and one or two just above cordæ vocales.	None.	None.
8	F.	1 8	Idiopathic.	Upper and middle lobe in 1st, lower in 2d and 3d stages.	Upper lobe in 1st, lower in 2d and 3d stages.	None.	Containing abundant muco-purulent fluid. Somewhat congested.	None.	None.
9	F.	1 8	Idiopathic.	Upper lobe solid, in state of chronic pneumonia, middle in 3d, lower in 1st stage.	Upper lobe upper two thirds in 1st, lower third in 3d stage, lower lobe in 1st stage.	None.	Contained very little mucus. Not at all injected.	Right pleura coated with yellow lymph, contained ʒiij turbid sero-purulent fluid, slight adhesions on left side.	None.

No.	Sex			Nature of disease	Seat and stage (1)	Seat and stage (2)	Morbid appearances	State of bronchi	Pleura	Other organs
10	F.	1	9	Supervening on phthisis.	Upper lobe in 2d; middle and upper thirds lower in 2d stage.	Upper lobe, lower part in 3d; marginal pneumonia of lower lobe in 2d stage.	Mixture of softened tubercle, with the gray hepatization in left lung,	Adhesive mucus in larger bronchi. Other points not noticed.	None.	Extensive tubercular deposit, partly softened in lungs and bronchial glands.
11	F.	1	9	Supervening on measles, complicated with diphtheritis.	Upper lobe generally in 1st, patch at upper part in 3d stage; lower and middle lobes in 3d stage.	Upper lobe generally in 1st, patch at upper lower edge in 3d stage; lower two thirds of lower in 2d and 3d stages.	Emphysema of both upper lobes; some lobular pneumonia in 1st vesicular stage of left upper; vesicular pneumonia in left lower lobe.	False membrane extending from pharynx into larynx; trachea and bronchi generally not congested, with but little mucus. Very adhesive muco-purulent secretion, in dilated terminations of bronchi, especially of left lower lobe.	Slight adhesions between lobes of right lung.	None.
12	M.	2	0	Idiopathic.	Middle lobe in 2d; lower, far advanced in 3d stage.	Lower lobe, far advanced in 3d stage.	Vesicular emphysema of both upper lobes, some interlobular of left. Marginal vesicular pneumonia of right middle lobe, and in various parts of left lower lobe. A few patches of lobular pneumonia in 1st stage in left upper lobe.	Scanty muco-purulent fluid. Bronchi pale, except where lung was in 3d stage, there red. Slight dilatation, more considerable where lung was inflamed.	None.	None.
13	F.	2	3	Complicating measles, which supervened on hooping-cough.	Upper lobe, upper and posterior part in 1st, lower in 3d stage.	posterior margin in 2d stage; middle lower, advanced in 3d stage.	Emphysema of both upper lobes; lobular pneumonia in 1st stage in parts of left upper and in 3d stage, in parts of left lower lobe.	Contained purulent fluid only where lung was in gray hepatization, and injected only where pneumonia existed.	Slight but numerous ecchymoses beneath pulmonary pleura on both sides.	None.

LOBAR PNEUMONIA (CONTINUED.)

No.	Sex.	Age. yrs. mos.	Idiopathic or Consecutive.	Seat and Stage. Right Lung.	Seat and Stage. Left Lung.	Complications. With other Affections of the Lung.	Complications. With Affections of the Bronchi.	Complications. With Affections of the Pleura, &c.	With Tubercle.
14	F.	3 0	Supervening on acute hydrocephalus in phthisical child.	Middle and lower lobes in 1st stage.	Lower lobe in 1st stage.	Emphysema of both lungs, especially marginal.	Not noticed.	None.	Tubercle in almost every organ; both crude and softened in the lungs and bronchial glands.
15	M.	3 6	Idiopathic.	Upper lobe in 1st; lower lobe in 1st and 2d stages.	Lower lobe in 1st stage.	None.	Not noticed.	None.	None.
16	F.	3 6	Idiopathic.	Upper and middle lobes in 1st; lower in 1st and 3d stages.	Upper lobe in 1st stage.	Emphysema of upper lobe of left lung; lower lobe compressed impervious to air.	Greatly congested, some muco-purulent fluid.	Universal adhesions on right side, with patches of lymph on lung. Left pleura adherent above, lower down, containing ʒvj. of pus. Thick layer of lymph lining the pericardium and coating the heart; ʒiv of serum in sac of pericardium.	None.
17	M.	4 0	Idiopathic.	Whole lung in 1st stage.	Whole lung in 1st stage, verging in parts on 2d.	Slight emphysema at margin of both lungs.	Pale. No notice as to fluid.	None.	None.

No.	Sex			Nature						
18	M.	4	0	Idiopathic.	Upper lobe in 1st and 2d stages, mid-dle in 1st.	Whole lung in 1st stage.	Inflamed margin, about a quarter of an inch in depth, extending round greater part of right lung; lower right lobe compressed.	Contained considerable quantity of puriform fluid. Slightly con-gested, smaller bronchi dilated.	Right pleura lined, and lung coated with lymph. Con-tained ℥iv sero-purulent fluid.	None.
19	M.	4	0	Idiopathic.	Lower lobe in 2d and 3d stages.	Lower lobe in 1st and 2d stages,	Right middle and lower lobes somewhat com-pressed.	Puriform fluid in bronchi of right lung. State as to congestion not mentioned.	Lymph on both pleura, serous effu-sion, with flakes of lymph; ℥iv on right side, less on left.	None.
20	M.	5	6	Accompany-ing dropsy after scarla-tina.	Whole lung in 1st stage.	Whole lung in 1st stage.	Considerable œdema of both lungs.	Not stated.	Considerable se-rous effusion on both sides, and par-tial adhesions, and effusion of lymph.	Tubercles, some softened in left lung.
21	M.	9	0	Accompany-ing dropsy after scarla-tina.	Upper lobe in 3d; lower in 1st, and its upper part in 2d stage.	Upper lobe in 1st; lower in 2d and 3d stages.	Lobules of solid lung in upper lobe of left lung.	Not stated.	Small quantity of lymph on right side, more, and some se-rous effusion, on left side.	None.
22	F.	11	0	Supervening in course of acute rheuma-tism.	Upper in 1st; middle 1st begin-ning; lower lobe in 2d, and inferiorly in 3d stage.	Lower lobe partly in 2d stage.	Emphysema of left upper; great compres-sion of left lower lobe.	Not stated.	Partial adhesions, Oss of serous effu-sion on left side. Lymph on heart, partially adherent pericardium; san-guineous effusion into its sac.	None.

LOBULAR PNEUMONIA.

No.	Sex.	Age. yrs. mos.	Idiopathic or Consecutive.	Seat and Stage. Right Lung.	Left Lung.	With other Affections of the Lung.	Complications. With Affections of the Bronchi.	With Affections of the Pleura, &c.	With Tubercle.
1	F.	0 9	Idiopathic.	Upper and middle lobe in 1st stage, generalized lobular pneumonia in 2d stage. margins	Lower half of upper lobe in 1st stage, generalized lobular pneumonia.	Emphysema of upper half of left upper lobe.—Lobar pneumonia in 1st stage of left lower lobe. Marginal vesicular pneumonia in many parts of left lung, especially at lower edge of upper lobe.	Considerably injected; containing much rusty mucus.	None.	None.
2	M.	1 2	Idiopathic.	Upper and middle in 2d and 3d stages; the inflamed lobules were quite distinct.	Patch as large as a walnut at upper part of upper lobe in 3d stage, and also at its margin.	Emphysematous patches in both lungs. Right lower lobe in 3d, and left lower in 1st stage of lobar pneumonia.	Not much injected, lined with yellow tena-cious secretion, inter-mediate in consistence between false membrane and pus, blocking up smaller bronchi, more membraniform in the larger.	Recent adhesions at lower part of right side.	None.
3	F.	1 4	Idiopathic.	Upper lobe in 1st stage; inflamed lobules distinct.	Upper lobe in 1st stage, lobular pneumonia becoming generalized.	Right lower lobe compressed; left lower lobe in 3d stage of lobar pneumonia.	Not stated.	Fluid on both sides less in quantity but more turbid on left. Thick layer of lymph on each pleura. Pericarditis, with effused lymph and sero-purulent fluid.	Tubercle in bronchial glands and left lower lobe.

No.	Sex			Cause	Left lung	Right lung	Other	Bronchial tubes	Pleura	
4	F.	1	9	Idiopathic.	Upper in 1st stage, patch in 2d stage in upper part, inflamed lobules distinct.	Two patches in 2d stage, each as large as a walnut, in upper lobe.	Emphysema between inflamed lobules of both lungs. Right lower lobe in 2d, left lower lobe in 1st stage of lobar pneumonia.	Slightly congested; containing some muco-purulent fluid.	Ecchymoses beneath pulmonary pleura on both sides.	None.
5	M.	1	9	Following hooping-cough.	Upper lobe in 1st and 2d stage, lower the same, inflamed lobules distinct, but in 2d, some congestion of intervening lobules.	Upper lobe as the right, but in 1st stage only; lower whole of middle in state of vesicular pneumonia, and the lobular pneumonia becoming general-ized.	Right upper lobe in two lower thirds, and middle in state of vesicular pneumonia; the same at lower margin of right lower lobe.	Great injection, very little mucus; not mentioned whether dilated.	General recent adhesions, and thin coating of lymph on both sides.	None.
6	M.	2	6	Accompanying measles, which followed croup.	Whole lung in 2d and 3d stage, the pneumonia having become general-ized, except healthy spot as big as a pigeon's egg at upper part of upper, and lower of middle lobe.	Upper lobe in 1st stage, inflamed lobules quite distinct; more generalized in lower, but in 1st stage, except at periphery, where the lung was solid.	Vesicular pneumonia in various parts of right lung.	Not stated.	Slight recent adhesions on right side.	None.
7	F.	3	0	Idiopathic.	Upper lobe as the left in 1st stage, except patch at upper part in 2d; lower lobe, pneumonia generalized, and in 2d stage.	Upper and middle in 1st stage; inflamed lobules distinct, but some congestion in and around them; ge-neralized in lower lobe, and at lower part in 2d stage.	Vesicular pneumonia of right middle lobe.	Not stated.	None.	None.

LOBULAR PNEUMONIA (CONTINUED.)

No.	Age yrs. mos.	Sex.	Idiopathic or Consecutive.	Seat and Stage. Right Lung.	Seat and Stage. Left Lung.	Complications. With other Affections of the Lung.	Complications. With Affections of the Bronchi.	Complications. With Affections of the Pleura, &c.	Complications. With Tubercle.
8	3　0	F.	Following hooping-cough.	Generalized lobular pneum. of lower part of upper, whole lower lobe, and lower part of lower lobe, in 1st and 2d stages, and in parts in 3d, with distinct purulent deposits as large as a millet seed in lower lobe.	Lower third of upper lobe in same state as the right lung.	Emphysema of upper two thirds of both upper, and of right middle lobes. Extensive vesicular pneumonia in many parts of right lung.	Much injected, containing dirty pus. Great dilatation of bronchi.	Slight recent adhesions on both sides.	None.
9	4　0	F.	Following hooping-cough.	In parts of all the lobes distinctly circumscribed lobular pneum. in 2d stage, also in 3d forming small vomica.	In exactly the same condition as the right.	Emphysema at upper part of both upper lobes. Vesicular pneumonia at margins of both lungs in various parts.	Greatly congested, loaded with purulent fluid, minute branches greatly dilated.	Firm adhesions on left side.	Crude tubercles in lungs, and bronchial glands.
10	6　2	M.	Following hooping-cough.	Distinct lobular pneumonia in 1st stage in upper and middle lobes; generalized in lower, mostly in 2d stage.	Both lobes in same condition as right, except pneumonia more generalized.	Emphysema of both upper lobes.	Greatly congested, containing no fluid. State as to dilatation not mentioned.	Firm old adhesions on both sides.	Tubercle in bronchial and mesenteric glands.
11	6　6	M.	Following hooping-cough.	Distinct lobular pneumonia of whole lung, in 1st stage, with congestion of intervening lobules.	In same condition as right lung.	Great emphysema; more of right than of left.	Greatly injected, containing a little muco-purulent fluid. Extreme dilatation, especially of the smaller branches.	Firm old adhesions on each side.	Tubercle in bronchial glands.

VESICULAR PNEUMONIA.

No.	Sex	Yrs.	Mos.	Nature						
1	F.	1	0	Idiopathic.	Lower lobe, and at upper part of upper lobe.	Both lobes.	Considerable emphysema at different parts, and great congestion of others.	Somewhat congested in larger divisions; purulent fluid in some of the extreme bronchi; and in pulmonary vesicles at upper part of right upper lobe unsurrounded by inflamed lung.	Extensive adhesions, and effusion of lymph on right side; scanty on left.	None.
—	—									
2	M.	2	9	Idiopathic.	Lower edge of upper, and to a greater extent at lower edge of lower lobe.	Lower two thirds of upper, and whole of lower lobe.	Not stated.	Not stated.	Extensive adhesions on left, slight on right side.	None.
—	—									
3	F.	4	0	Following hooping-cough.	Lower part of upper, whole of middle, lower part of lower lobe.	Lower part of upper, whole of lower lobe.	Emphysema of upper lobes of both lungs.	Containing but little fluid, but greatly dilated.	Old adhesions on both sides.	In bronchial glands.
—	—									
4	M.	7	6	Idiopathic.	Fringing middle and lower lobes.	Through greater part of both lobes.	Emphysema of both upper lobes. Lobules in various parts of both lungs, especially of the left in state of gray hepatization.	Congestion of larger bronchi; abundant tenacious puriform fluid in the larger, and extending into many of the smaller bronchi. Considerable dilatation of the smaller bronchi.	Slight adhesions on left side.	In one bronchial gland, but had undergone the cretaceous change.

No one can be more sensible than I am of the many deficiencies in the above tables, and I can only plead in extenuation that almost all the post-mortem examinations were made without assistance, in the houses of the poor, whose prejudices and suspicions often rendered it impossible to devote to such investigations more than a small portion of that time which they require. The facts, however, though incomplete, may be relied on, since in no case are they stated from recollection, but always from notes taken on the spot.

The first conclusion which may fairly be deduced from these data is that lobar pneumonia attacks children much more frequently, in comparison with the other forms of the diseases, than has been imagined by French writers; and that differences of age do not occasion such a liability to one form of inflammation of the lungs, and such an immunity from the other form as would appear from their statements. Of twenty-two post-mortem examinations of cases of lobar pneumonia, nineteen are of children under five years of age, and ten of children under two; while two of the post-mortem examinations of cases of lobular pneumonia are of children between the ages of six and seven.

A more striking difference between the two classes of cases appears in the fact that five of the cases of lobular pneumonia supervened on hooping-cough, and that in another instance the disease complicated an attack of measles which succeeded to croup. In the remaining five cases indeed, it is said to have been idiopathic, but even here the bronchi were found either greatly injected or containing a very abundant secretion in their cavities. These circumstances give considerable probability to the supposition of some French writers, that lobular pneumonia occurs as the result of the extension of inflammation of the bronchi to the substance of the lung,—a theory which would explain many of the peculiarities that distinguish it from lobar pneumonia. Its greater prevalence during infancy and early childhood than subsequently, might perhaps be accounted for in accordance with this hypothesis by the extreme frequency of catarrh among young children, and by the fact that in the great majority of cases hooping-cough and measles occur before the commencement of the second dentition.

The appearances produced by Lobar Pneumonia in the child do not require particular notice, since they differ in no important respect from those observed in the adult.

I once met with a condition of the lung, (which I believe to be very rare,) closely resembling what some have described as Chronic Pneumonia. (See Table of cases of Lobar Pneumonia, No. 9.) The subject of this observation had suffered from cough and difficult breathing for a month before she came under my care, and died ten days afterwards. On examining the body a small quantity of clear serum was found in the cavity of the left pleura, and a few easily broken down adhesions existed between the left lung and the ribs. The right pleura contained from ʒij to ʒiij of a tubid sero-purulent fluid, and the lung was invested with a thin layer of yellow lymph by which it was in many parts connected with the ribs. The upper two thirds of the upper lobe of the left lung were slightly congested, the lower third was in a state of gray hepatization, with purulent depôts in many of the pulmonary vesicles constituting the state described as vesicular pneumonia or vesicular bronchitis by different authors. The left lower lobe was in the first stage of pneumonia. The different lobes of the right lung were adherent to each other. The lower lobe was in the first, the middle in the third stage of pneumonia. The upper lobe was perfectly solid, of a light gray colour, resembling very much a piece of soap, smooth when cut, not soft, but easily broken. In its substance were patches of a red colour, like wine lees; soft and pultaceous to the touch, and breaking down into a kind of quagmire, in which no trace of pulmonary tissue was discernible. The lower edge of the lobe had generally this red appearance and pultaceous consistence, but little patches of it, some not bigger than a pea, were diffused through its substance in various parts. Neither the lungs nor any other organ in the body showed any trace of tubercle.

The condition to which the appearances in this case bear the closest resemblance is not that gray form of chronic pneumonia described by Andral, in which

the lung retains its granular structure; but a state which has been described by
Hasse in his Morbid Anatomy. That writer says* that sometimes he has found
"in children who have had symptoms of inflammation of the lungs, a light gray
nearly white, or yellow, induration of a whole lobe or of several lobules, which
seems to affect the upper lobes more frequently than the lower." The appear-
ance is quite different from that sometimes met with in children when a whole
lobe is converted by tubercular deposit into a solid, cheesy, substance; and I am
the less disposed to consider the change as any variety of tubercular degeneration,
owing to the absence of tubercle from all other parts of the body.

There is a condition of the lungs, described under the name of *carnification* by
MM. Rilliet and Barthez, and regarded by them as of frequent occurrence. I
have also met with it, though neither so frequently, nor involving so large an ex-
tent of pulmonary tissue as in the cases described by those gentlemen. I have
not, however, included it in the table of Post-Mortem Appearances, since some
of the examinations there recorded, were made before I had met with their work,
and consequently before my attention had been especially directed to it. They
describe portions of lung which have undergone this change as being depressed
below the level of the surrounding tissue, of a violet colour, presenting when cut
a smooth, red, surface, yielding a bloody serum when squeezed, in which no air
bubbles are contained, and in short resembling a portion of muscle. The com-
parison they make of lung in this condition, with a portion of fœtal lung is very
exact; its appearance indeed is precisely such as is observed in infants who have
died from Atelectasis Pulmonum. The advanced age of many of the patients in
whom it was noticed by MM. Rilliet and Barthez, as well as by myself, forbids
us to attribute it to that cause. They suggest that it may be a form of
chronic pneumonia, but this supposition can hardly be considered tenable, if
we bear in mind that in many of the instances in which it was observed the in-
flammatory process ran its course with great rapidity. Neither does it seem
attributable to the pressure of fluid effused into the pleura, since in one only of
MM. Rilliet and Barthez's eleven cases in which the lung was carnified did there
exist any effusion into the sac of the pleura;† a statement which my own expe-
rience fully confirms. This condition usually presented itself to me affecting a
cluster of two or three lobules in the substance of a lung, or more frequently
fringing the lower edge of a lobe; the lower edge of the upper or middle lobe
being its seat more frequently than the lower edge of the lower lobe. I would
not have alluded to a condition on the real nature of which I can throw so little
light, but from the hope that the attention of others more favorably circumstanced
for the pursuit of morbid anatomy may thereby be directed to the subject.

Closely allied to lobar pneumonia is that œdematous condition of the lung, not
unfrequently met with in children dying with chest affections in the course of
dropsy after scarlet fever. In most cases where this state is found after death,
the dyspnea has either come on, or, at least, has been aggravated very suddenly,
being attended with great distress, and exceedingly tumultuous action of the heart,
and proving very rapidly fatal. A considerable quantity of serous fluid is gene-
rally found in each pleura, both lungs are universally congested, and gorged with
bloody, frothy fluid, which exudes abundantly on cutting into them. This is
evidently not the result of mere position, since the upper are quite as much affected
as the lower lobes. The congestion appears to exist in the same degree every-
where, and though the texture of the lung may be less firm than natural, yet I
have never found any portion in a state of actual hepatization.

LOBULAR PNEUMONIA. It has not been attempted in the table of morbid ap-
pearances to make that distinction between cases of simple, and of generalized
Lobular Pneumonia which has been drawn by MM. Rilliet and Barthez. It

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* Op. cit. p. 292.

† These gentlemen base their observations in their recent work on forty-two instances
of carnification, and they expressly state that their remarks do not refer to that form of
the lesion which is the mechanical result of effusion into the pleura. (Op. cit. t. i. p. 74.)

will be seen by a reference to the table, that in almost every instance, even if the inflamed lobules in one lung were distinct, the pneumonia had become generalized in the other. Perhaps, too, MM. Rilliet and Barthez would have found this to be the case more frequently, if the children who came under their notice had been placed in conditions more favorable to their bearing up under the disease, and if time had thus been given for the lobular pneumonia to become generalized.

First and second stages. A lung affected with Lobular Pneumonia presents a mottled appearance, portions of a deep red colour being interspersed in the midst of others having a natural aspect. This condition closely resembles that of a lung which is the subject of Atelectasis, but there is one point of difference by which the two states may very generally be distinguished from each other. In each, the dark portions of the lung are depressed beneath the general level; but in Atelectasis this depression is real and owing to the dark portions never having been expanded by the entrance of air; in Lobular Pneumonia it is apparent only, being produced by the emphysematous distention of the surrounding tissue. A section of the lung presents an appearance similar to that of its surface, and shows even more clearly that the red portions are inflamed lobules, and the pale lobules those which have not been the seat of inflammatory action. It happens indeed comparatively seldom, that single lobules are found affected, the inflamed patches usually comprising four or five, which together form a mass of the size of a nut or an almond. These portions of inflamed tissue give to the lung an unequally hard feel, such as is described, though apparently without its cause being understood, in Dr. Watt's valuable monograph.* It is there said in the account of the post-mortem appearances found in one case, that "The lungs felt knotty, and uncommonly firm in some places; but on cutting into them no tubercles, such as are met with in phthisis, could be detected." If the patient lives for some time, the intervening substance usually becomes affected and the lobular is thus converted into lobar pneumonia. This change does not appear to take place by the gradual extension of disease from each inflamed lobule as from so many distinct centres, in which case one would expect to see a gradual shading off of the inflammation from the dark, highly-inflamed centre, to the paler, less inflamed periphery; but sooner or later the whole intervening pulmonary substance seems at once to become the seat of inflammatory action which runs its course as in ordinary lobar pneumonia. It happens, indeed, sometimes in cases where an entire lobe is affected with lobar pneumonia in the first stage, that some dark-red and perfectly solid patches are found which might seem to indicate that the disease began as lobular pneumonia. But even here, there is none of that gradual deepening in intensity of the inflammatory appearances as we approach each solid lobule which must needs exist if lobular pneumonia became general by involving the different lobules in succession. In a few cases in which pneumonia, originally lobular, was becoming general when death took place, I have found the pulmonary tissue intervening between the inflamed lobules "drier than usual, not at all engorged, as in Laennec's first stage, and of a bright-red colour from intense arterial injection;" in that condition in short, regarded by Dr. Stokes† as constituting really the first stage of pneumonia.

Third stage. In the greater number of cases of lobular pneumonia death occurs before the inflamed lobules have passed into the stage of gray hepatization, or the lobular pneumonia becomes general, and the third stage consequently presents no peculiarity. To this, however, there are occasional exceptions, the inflamed lobules either becoming infiltrated with pus, and then presenting on a small scale the same appearance as is seen on a large scale in ordinary gray hepatization; or each lobule becomes the seat of a small, distinct abscess; with numbers of which the lung seems riddled. These pulmonary abscesses were met with twice; both times in cases where pneumonia had supervened on hooping-cough. In one instance, (Table of cases of Lobular Pneumonia, No. 9,) they were found in both lungs and coexisted with extensive tubercular deposit in those

* Treatise on Chincough.—Glasgow, 1813, 8vo, p. 131.
† On the Diseases of the Chest.—Dublin, 1837, 8vo, p. 311.

organs. It might indeed be objected to this case, that the supposed vomicæ were in reality softened tubercles, though it is my belief that no such error was committed, and that none of the tubercles had passed the crude stage. Be that, however, as it may, no such objection exists in No. 8, in which the vomicæ existed only in the lower lobes of each lung, while no tubercle was found in any organ of the body. These collections of matter which vary in size from that of a millet seed to that of a pea, are found in the centre of the lung as well as near its surface. They sometimes communicate distinctly with a bronchial tube, but at other times no such communication can be clearly traced. They are irregularly circular, not lined by any smooth membrane, nor surrounded by a barrier of indurated lung such as is often seen around small collections of softened tubercle. They may be further distinguished from tubercle by the circumstance that they usually occupy the lower lobes only, and that they are found in cases where all other organs are free from tubercle. It is decidedly a rare condition. MM. Rilliet and Barthez met with it only twice in forty-three post-mortem examinations;* and I but twice in thirty-seven.

VESICULAR PNEUMONIA. That state of the lungs known by the name of Vesicular Pneumonia or Vesicular Bronchitis first excited general attention from a description of it contained in a dissertation by M. Lanoix. The appearance, however, is described by Dr. Watt† who had observed it and referred it to its true cause. A lung, or a portion of lung which is the seat of this affection, presents an uneven surface; the inequality being produced by the presence of a number of small, circular, yellowish prominences, which bear a considerable resemblance to crude tubercles. They may, however, readily be distinguished from tubercle, for not only do they almost always occupy the lower margins of the different lobes, but on puncturing any one of them with the point of a scalpel, a drop of pus will exude, showing them to be small collections of matter. The cavity in which these purulent collections exist appears to be that of the extreme pulmonary vesicles, a fact which may be ascertained by tracing a minute bronchus to its termination in one of these little sacs.

This condition is a very frequent complication both of lobar and lobular pneumonia, when it fringes the inflamed lobes, especially at their lower margins. Occasionally, too, it involves the whole of the middle lobe of the right lung, but it will be seen by a reference to the table that it seldom constitutes the chief lesion. In each of the four cases also in which vesicular pneumonia was the most prominent morbid appearance the lungs presented signs of the other forms of pneumonia in a more or less advanced stage; the only exception to this rule being in No. 1, in which puriform secretion was contained in the pulmonary vesicles at the upper part of the upper lobe of the right lung uncombined in that situation with any of the other forms of pneumonia.

COMPLICATIONS. *Affections of the bronchi.* The state of the bronchi, and the nature of their contents were noted, though not with all the minuteness desirable in twenty-five cases. The following general results will be found, however, very nearly accurate. Some degree of increased redness of the air-tubes exists in most cases of pneumonia: in lobar pneumonia, however, this redness is rarely intense, and is very often met with only in those situations where the substance of the lung itself is inflamed. In lobular pneumonia, intense congestion of the air-tubes is much more frequently observed, and is especially remarkable in the lobular pneumonia, which supervenes on pertussis. The bronchi are oftener empty in lobar than in lobular pneumonia, though in the former it is common to find puriform secretion in the bronchi near to any part which has passed into the third stage of pneumonia. Sometimes, too, abundant mucous fluid is found in the air-tubes while their lining membrane is quite pale; the accumulation of fluid in these instances being attributable to the inability of the patient to expectorate. In lobular pneumonia secretion of some kind or other is usually contained in the bronchi. It is oftener mucous than puriform, sometimes scanty,

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* In their recent work, they give the proportions as 26 in 314 post-mortem examinations of lobular pneumonia, p. 67.

† Op. cit. p. 139.

occasionally very abundant, and in this case it is not unfrequently very tenacious, and of a consistence approaching to that of false membrane. In these instances the secretion is usually more membraniform in the larger bronchi, more fluid in those of smaller caliber, which are sometimes rendered impervious to air by its quantity. I have found this secretion nearly approaching the membranous form only in two cases, in both of which it was associated with lobular pneumonia. Many points connected with this affection are undetermined; and some French writers * lean to the opinion of its being an essential disease, a true croup of the bronchi, and regard the pneumonia with which it is associated as a frequent but not necessary complication. I do not feel myself competent to offer an opinion on the subject, but will merely observe, that in neither of the two cases above alluded to were the symptoms observed during life different from those of ordinary pneumonia.

Dilatation of the bronchi was observed in eleven instances, but it was possibly overlooked in some cases where it did not exist in a very marked degree. This dilatation was never irregular, as it is occasionally in the adult, when it gives rise to an appearance which has been likened by Laennec to that of some marine fuci. It always presented the tubular form : was limited, when slight, to the smaller bronchi; but when considerable it likewise involved those of larger size. It will be seen by reference to the tables, that it was in cases where pneumonia had supervened on hooping-cough, that this dilatation existed in the most marked degree. The same tables also show that the measure of dilatation of the air-tubes bore no proportion to the amount of fluid they contained; a fact which may further prove that some theory other than that of their mechanical distention must be adopted in order to explain this occurrence. The change effected by the inflammatory process in the vital contractility of the tube is probably, as Dr. Stokes suggests, the chief cause of this condition, to which in cases of hooping-cough is superadded the influence of the violent inspirations which occur during the paroxysms of the cough.

Emphysema. The extreme frequency of emphysema as a complication of infantile pneumonia renders some notice of it necessary. It was found occupying the upper part of each lung, and frequently fringing the lower edge of each upper lobe. It was usually most considerable in cases where severe bronchial symptoms had existed, but was also very extensive in some cases which had never been marked by violent cough, but in which the inflammation involved a very considerable extent of lung, and ran a very rapid course. Interlobular emphysema was observed in four cases, sometimes simply dissecting the different lobules from each other, at other times giving rise to a number of vesicles containing air which covered the surface of the upper lobe of each lung.

Pleuritis. In 12 of the 37 cases no traces of inflammation of the pleuræ were found; in 5 there existed old adhesions more or less extensive, and in 20 there were the marks of recent inflammation. In 12 of the 20 cases both pleuræ were affected; in 6 adhesions existed only on the right, and in 2 only on the left side. One of the cases of double pleurisy might be characterized as slight; in 5 others the disease, though slight on one side, was extensive on the other, and in the remaining 6 extensive pleurisy existed on both sides. In 17 cases adhesions between the costal and pulmonary pleura and the presence of more or less lymph on the surface of the lung were the only signs of pleurisy; but in 8 cases there was also effusion of a notable quantity of fluid. In 3 instances this effusion was serous; in the remaining 5 it consisted of a turbid, seropurulent or purulent fluid.

The above-mentioned results which agree very closely with those obtained by MM. Rilliet and Barthez show how little foundation exists for the statement which has been made, that " there does not appear to be much tendency to pleu-

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* See the cases and remarks of Jurine in Royer Collard's Rapport sur le Croup, 2ieme ed.—Paris, 1836, p. 34; and p. 222, No. viii. of the Appendix. Also M. Fauvel's Recherches sur la Bronchite Capillaire, &c.—Paris, 1840, 4to.

ritis in the young subject."*   This error has most likely arisen from Dr. Maun-
sell applying to children of all ages, that which is true only of those who are very
young.   It appears probable indeed, from the researches of M. Ch. Baron,† that
the liability to pleurisy is much greater among children above 2 years of age,
than among those who are younger; since " of 3392 autopsies of children from
1 to 2 years old, pleurisy was found only in 205, and in 79 the pleura was other-
wise unhealthy from some non-inflammatory cause; or, in other words, inflamma-
tion of the pleura was found only in 6 per cent., while in 181 autopsies of
children from 2 to 15 years old, the pleura of 158, or 87 per cent. presented signs
of inflammation."

Pericarditis.   Of the three instances in which pericarditis coexisted with pneu-
monia, one was a case of rheumatic pericarditis; in the other two the pericardium
was probably affected by the extension of the inflammation to it from the pleura.
M. Ch. Baron ‡ mentions two instances in which he believes that this occurred,
and two years ago a little girl was under my care in whom signs of pneumonia
had existed for some days, and a pleural friction sound had been heard for a short
time, but had again disappeared when a to-and-fro sound became distinctly audi-
ble, accompanying the heart's action, and continued to be heard until the patient
died.   Unfortunately a post-mortem examination could not be obtained.

Tubercle.   Tubercles were found in 10 cases either in the lungs or the bronchial
glands, or in both.   In 5 they coexisted in the two situations, in 1 they were
found only in the lungs; in 4 only in the bronchial glands, and in 1 of these 4 a
single gland was affected, and that had undergone the cretaceous change.   Com-
paratively rare, however, as it is to meet with tubercle in cases of acute inflam-
mation of the lungs, there is a kind of bastard pneumonia which is by no means
unusual in infants whose lungs have undergone very extensive tubercular dege-
neration, such as is seldom met with after the first two years of life.   It comes on
insidiously in infants at the breast, or in children in whom the process of dentition
is not completed; its symptoms, consisting in some exacerbation of the previously
existing fever and increase of the cough and dyspnea, attract but little attention,
and serious alarm is not excited until it is seen how little they are amenable
to any treatment.   Its course is generally slow, occupying a fortnight or three
weeks, but instances do occur in which the fatal termination takes place much
more speedily.   A lung which has been the subject of this morbid process presents
a singular appearance; parts of it being of a solid texture, and yellowish white
colour from tubercular deposits, interspersed with patches of a deep red hue, which
are the lobules that were not involved in the tubercular degeneration, but which
have become the seat of inflammation.

CAUSES OF PNEUMONIA.   I have now noticed all the chief points in the mor-
bid anatomy of pneumonia which my own observation could serve to elucidate,
and pass next to the examination of those circumstances which favour the deve-
lopment of the disease.

Influence of season.   The season of the year has always been regarded as exer-
cising considerable influence on the development of pneumonia, which has been
generally supposed to be most frequent in the later winter and early spring
months.   The proportion borne by cases of pneumonia to all the cases, 2450 in
number, that came under my notice at the Infirmary for Children, in 1841 and 1842,
taking the mean of the two years, is shown to have been, during each three
months, as follows:

In 1st three months	.	.	.		5·1	per cent.
2d ,,	.	.	.	.	2·5	,,
3d ,,	.	.	.	.	3·8	,,
4th ,,	.	.	.	.	5·8	,,

Although this table does not quite accord with the generally received opinion
as to the season when pneumonia is most prevalent, yet it tallies exactly with the

* Maunsell and Evanson on the Diseases of Children, 2d edition, p. 309.
† De la Pleurésie dans l'Enfance.—Paris, 1841, 4to, p. 52, Note 3.   ‡ Ib. p. 49.

results presented in the Third Report of the Registrar-general. It appears from that document, that the greatest mortality from pneumonia, among persons under the age of fifteen years, takes place in the month of December; and on a comparison of the different quarters of the year, it will be seen that the deaths from pneumonia are to the deaths from all causes, of persons under fifteen, in the following proportions:

In 1st three months		.	.	.	15·3 per cent.
2d	,,	.	.	.	.	11·4 ,,
3d	,,	.	.	.	.	8·9 ,,
4th	,,	.	.	.	.	18·7 ,,

Age. The age of the subject appears to exercise a very considerable influence in predisposing to pneumonia. During the years 1841 and 1842, 118 cases of idiopathic pneumonia came under my notice. The following table represents the ages at which these cases occurred, and the proportion per cent. they bore to the total number of cases of all diseases at corresponding ages:

Age.			Male.	Female.	Total.	Proportion to all cases.
Under 1 month . . .			0	0	0	0 per cent.
Between 1 and 2 months .			1	0	1	2·7 ,,
2	3	...	3	0	3	6·5 ,,
3	6	...	3	1	4	3·1 ,,
6	12	...	19	6	25	8·7 ,,
12	18	...	9	17	26	8·6 ,,
18	2 yrs.	...	5	6	11	5·5 ,,
2 yrs.	3	...	11	10	21	7·8 ,,
3	4	...	5	7	12	4·7 ,,
4	5	...	3	4	7	3·9 ,,
5	6	...	3	1	4	2·5 ,,
6	7	...	1	0	1	·8 ,,
7	8	...	1	1	2	1·9 ,,
8	9	...	0	0	0	0 ,,
9	10	...	0	1	1	1·6 ,,
			65	53	118	

From this table it appears that during the first five years of life, the cases of pneumonia bore the proportion of 10·3 per cent. to the total cases, while during the succeeding five years they were in the proportion of only 1·3 per cent. of the total cases. It will further be remarked, that during the first two years of life the proportion is as high as 17·5 per cent., and that the period when pneumonia is most prevalent coincides exactly with that during which the process of dentition is going on most actively; namely, from the sixth to the eighteenth month.

A substantiation of the above statement is furnished by the Third Report of the Registrar-general. It appears from tables which that report contains, that of 1553 deaths from pneumonia which occurred in Liverpool, Birmingham, and Manchester, 1348, or 86·7 per cent. were of persons under fifteen. Of these 1348,—1093, or 81 per cent. were of children under the age of two; and 1231, or 91·3 per cent. of children under three years old.

The influence of age on the production of secondary pneumonia is a point on which I have not such facts as could be represented in the numerical form, but my decided impression is, that it is nearly the same in secondary as in idiopathic pneumonia, and the observations of MM. Rilliet and Barthez are favorable to this opinion.

Sex. Of the 118 cases which form the subject of the foregoing table, 65 occurred among boys, 53 among girls; and the bills of mortality for Manchester, Liverpool, and Birmingham show a similar excess of males among the deaths from pneumonia under puberty. This excess is somewhat greater than the actual excess of male births suffices to explain, although, if we calculate 105 male to 100 female births, it must be confessed that the influence of sex is at any rate very small.

Previous health. French practitioners have insisted so strongly on the importance of previous ill health as predisposing to pneumonia, that the subject must not here be passed over without notice. In 33 cases the previous health of the patients was ascertained, and found in 25 instances to have been good, in 7 delicate, and only in 1 decidedly bad. The conclusion, therefore, that a previously indifferent state of health predisposes to pneumonia, cannot be adopted with reference to children attacked by the idiopathic form of the disease in this country.

Disease. I regret that I have not data sufficient to enable me to state with perfect accuracy the proportion of cases of different diseases in the course of which pneumonia supervenes as a secondary affection. It is my belief, however, that (not reckoning catarrh, the influence of which will be presently considered,) the chief diseases in the course of which inflammation of the lungs occurs may be ranged in the following order: Measles, Hooping-cough, Diarrhea, and Remittent Fever. I can confirm the statement which has been made by others as to the rarity of pneumonia in the course of scarlet fever, though the disease is by no means unusual in the course of the subsequent dropsy. In the few instances of smallpox which have come under my care, I have, in common with others, found inflammation of the lungs to be a most frequent and most fatal complication.

Catarrh. The authors of the most popular English work on the Diseases of Children say, that they " doubt much if pneumonia ever occurs in young children as a primary, idopathic affection ;" [*] and express their opinion that it always comes on as a secondary affection in the course of bronchitis. This assertion, coming with the weight which it necessarily receives from the deserved reputation of its authors, must, if erroneous, lead the practitioner into serious mistakes. That it is erroneous I feel fully persuaded. In 50 cases of idiopathic pneumonia I have carefully noted the mode of attack, and find that in only 15 was it preceded by catarrhal symptoms. This fact is shown in the following table, as also is the other fact that the frequency of catarrh, as a prelude to pneumonia, is greatest while dentition is going on; that is to say, during the first two years of life.

In Children of the following Ages	Pneumonia was		Total.
	preceded by Catarrh.	*not preceded by Catarrh.*	
Under 1 year	5	5	10
2	6	7	13
3	2	7	9
4	1	6	7
5	1	5	6
6	0	3	3
Above 6	0	2	2
	15	35	50

Previous attacks. There are some diseases which, after having occurred once, confer on persons an immunity from subsequent attacks. This, however, is far from being the case with pneumonia, for of 78 children who came under my care for inflammation of the lungs, 31 were stated to have had previous attacks of the disease; 21 once, 4 twice, 2 four times, and 4 were said to have had it several times, though the exact number of seizures was not mentioned. Of these 31, 10 were under two years of age, 10 between two and three, and the remaining 11 between three and six. Except in a few instances, these statements are necessarily founded on the reports of the mothers of the children, or of other nonprofessional persons, and are therefore open to error; but at any rate they approximate to the truth, and may the more readily be trusted from their coincidence with the facts published by M. Grisolle, in his work on Pneumonia.

[*] Maunsell and Evanson, Op. cit., p. 308.

From the detail of the post-mortem appearances produced by pneumonia, and the investigation of the causes which give rise to its occurrence, we pass next to the examination of the symptoms by which it is characterized.

Symptoms of Pneumonia. Idiopathic pneumonia presents some differences in its course, according as it is or is not ushered in by catarrhal symptoms. The latter being the most usual may first claim our attention, after which any peculiarities may be pointed out which distinguish the form that supervenes on catarrh.

First stage. Idiopathic pneumonia, unattended with catarrhal symptoms, is usually preceded for one or two days by a condition of general feverishness, exacerbated towards evening, with fretfulness, pain in the head, and great restlessness at night; or, if the child sleeps, its repose is unsound; it talks in its sleep, or wakes suddenly in a state of alarm. Cough comes on; at first short and hacking, but often it seems to cause no uneasiness to the child, and is so slight as hardly to attract the parent's notice. The thirst is considerable, the appetite impaired, the child showing distaste for solid food; or it begins to eat greedily, then suddenly leaves off, with the half masticated morsel in its mouth. The tongue and lips are of a florid red; the former is less moist than usual, and is generally coated in the middle with a thickish white fur. The bowels are generally constipated, and vomiting is not infrequent, especially in infants at the breast, who suck eagerly and by starts, then vomit the milk unchanged, and soon seek for the breast again. In them too, even in this precursory stage of pneumonia, the tongue is sometimes quite dry. If, while a healthy infant is sleeping, the mouth be gently opened, it will be observed that the tongue is applied to the roof of the mouth, and that respiration is carried on through the nares. So soon, however, as the lungs become affected, even when no other symptom exists than general febrile disturbance, and, perhaps, the vomiting above alluded to, the infant will be seen no longer to breathe solely through his nose, but to lie with the mouth partly open, and drawing in air through it. This imparts to the tongue its preternatural dryness, and the same inability to respire comfortably through the nares causes the child to suck by starts. The infant seizes the breast eagerly, sucks for a few moments with greediness, then suddenly drops the nipple, and in many instances begins to cry. As the disease advances, these peculiarities in the mode of sucking and of respiration often become more striking, but it is at the onset of the disease that it is of especial importance to notice them, since they afford most valuable indications of its real nature. Their value too is so much the greater from their being independent of those accidental circumstances which may modify so many of the other signs of pneumonia. There is not always marked dyspnea at this stage of the disease, and the frequency of the pulse and respiration is so much modified by position and other causes, that at the commencement of pneumonia very great dependence could not be placed on them, even if the fretfulness of the little patient, or its fears which the presence of the medical attendant often excites, permitted them to be counted with accuracy. Auscultation, too, if alone relied on, might possibly not guide the practitioner at once to the true nature of the disease; for all the above-mentioned signs may exist, associated even with very notable increase in the frequency of the respiration, and in older children even with pain referred to the chest or abdomen, without any other auscultatory phenomena than intense puerility of the respiration with, perhaps, an occasional sibilus.

It is not always, however, that the advance of the first stage of pneumonia is so gradual as has just been described, for sometimes a child who has gone to bed well wakes towards morning in a state of alarm, refusing to be pacified, with a flushed face, and burning skin, and hurried breathing, and short cough. This sudden supervention of pneumonia is not so often met with among infants at the breast as among children from two to four years old. The alarming nature of the symptoms usually induces the parents to apply at once for medical aid, and cases which have commenced thus tumultuously appear to be as amenable to treatment as those which seemed at first far less violent. Even in cases were treatment has not been at once adopted, the storm generally subsides in twenty-four hours, and the disease passes into the second stage without presenting any further peculiarity.

Second stage. The first stage of pneumonia for the most part passes gradually into the second, the symptoms of disturbance of the respiratory organs becoming by degrees more and more apparent. Infants who hitherto had had moments of cheerfulness in the early parts of the day, or about noon, now no longer wish to be removed from the cradle or from the recumbent posture in their nurse's arms; and older children have quite lost all interest in their play, they become drowsy, ask to be put to bed, and cry if taken up. The respiration is now evidently hurried, the abdominal muscles are brought into play to assist in its performance, and the *alæ nasi* are dilated with each inspiration. The cough has become much more frequent; it still retains its hardness, but lasts longer, sometimes coming on in paroxysms, and often seems to cause pain, the child crying when it comes on, and labouring to suppress it, an effort which appears only to make it last longer and return more often. The bright flush of the face and the florid tint of the lips have gone, but the heat of skin continues. It is now a pungent heat, which becomes more sensible the longer the hand is kept in contact with the surface. It is often unequal, the trunk being intensely hot, while the extremities, particularly the feet, are cold; and on inquiry it will be found that the temperature varies much at different times. The face has assumed a puffed, heavy, but anxious appearance, and when the child is very young, or the pneumonia very extensive, the lips put on a livid hue, which is also very evident around the mouth, while the face generally is pale. Anorexia continues, but the thirst is generally very urgent, and, in children who are not at the breast, vomiting for the most part ceases. Infants who suck, still very frequently vomit the milk, perhaps owing to the urgent thirst they feel inducing them to suck too greedily, and thus overload their stomachs; since they generally vomit almost immediately after leaving the breast, while they do not reject small quantities of fluid given from a cup or spoon. It will also be observed that the respiration of a child is now greatly hurried by the effort of sucking, that he drops the nipple panting from his mouth, or has not breath sufficient to make the vacuum necessary to bring the flow of milk.

Auscultation now detects mucous or crepitant rhonchus at the lower part of each lung, in which situation the air enters less freely than elsewhere. There is much difference even in cases which appear closely to resemble each other as to the extent of lung through which crepitation is heard as well as in the character of the crepitation itself. Usually, however, the crepitation is confined to the infra-scapular region, and it is of that kind which is known by the name of *sub-crepitant.* The results of percussion at this stage are often not very marked, but frequently a diminished sonoreity of the lower parts of the chest as compared with the upper, may be detected, and the impression conveyed to the finger is that of greater solidity below than above the scapula. This last sign is often very valuable, since it may be perceived at a time when the ear cannot clearly detect any actual dullness on percussion.

Third stage. In idiopathic pneumonia, unpreceded by catarrhal symptoms, death hardly ever takes place in this stage; but if the disease is left to itself, or if it is unchecked by the remedies employed, the second stage passes into the third; a transition which usually takes place in from twenty-four hours to three days. The respiration now becomes more laboured, and though its frequency is sometimes diminished, it will be found to have become irregular; several short and hurried inspirations being followed by one or two deeper, and at longer intervals, and these again by hurried breathing. The cough sometimes ceases altogether, or if not it is less frequent and looser, since it is now produced by the child's efforts to clear the larger air-tubes from the accumulating secretions. The voice is often lost, the patients speaking only in a hoarse whisper. The face looks sunken, the extremities are cold, and though the surface of the trunk is still hot, yet the skin has often lost something of its previous dryness, and clammy sweats break out, especially about the head. The pulse is extremely frequent and small, and its beats so run into each other, that it is almost impossible to count them. The child is extremely restless, tossing about from side to side, as much as its reduced powers will permit, or it lies in a state of half consciousness, though sensible when spoken

to, and fretful at being disturbed. If raised hastily from the recumbent posture, or if put to the breast, the great increase of dyspnea which is immediately produced shows how seriously the respiratory organs are affected. In many cases too the livid hue of the face and of the nails are further proofs of the great impediments which exist to the decarbonization of the blood. This condition seldom lasts above two or three days; for either life becomes gradually extinct, without the supervention of any new symptom, or convulsions occur which are followed by fatal coma, or the child recovers from it for a few hours, only to suffer a second attack of convulsions, and a return of the coma in which state it dies.

The disease, however, does not always terminate fatally in this stage, but a kind of imperfect recovery sometimes takes place. A diminution is obvious in the more alarming symptoms; the patient begins to express some desire for food as well as drink, and even has occasional gleams of cheerfulness. The cough which had almost or altogether ceased, returns, but it is hard and hacking as in the second stage, and though there is no urgent dyspnea, the breath is habitually short. The skin is hot, dry, and harsh; the tongue is red, dry, and sometimes chapped, or presents small aphthous ulcers at its edges; diarrhea is not unfrequent; the child wastes daily, and dies in the course of a week or two, worn out and exceedingly emaciated.

The peculiarities which distinguish that form of pneumonia which is preceded by catarrhal symptoms, may be enumerated in a few words. The disease in this case often comes on insidiously, and developes itself gradually out of the preceding symptoms without its being possible to fix the exact date of its attack. At other times, however, there is a well-marked accession of fever and dyspnea, and an aggravation of all the symptoms sufficient clearly to point out the time of the supervention of the pneumonia. The fever and heat of skin are less than in the other form of the disease, but the dyspnea and distress are usually greater, and the face presents from the first a more livid hue. The cough is less hard, but it oftener comes on in paroxysms which greatly distress the patient; the respiration is more hurried and more irregular, and this irregularity comes on at an earlier stage of the disease. Mucous and sub-crepitant rhonchus are generally heard very extensively in both lungs, but the true pneumonic crepitation is unusual; and the inflammation being in these cases very often of the lobular kind it may happen that no predominant affection of the lower lobes can be discovered. Head symptoms are more frequent; the patients' rest is disturbed, and they often mutter in their sleep, and have far more restlessness and jactitation when awake. Convulsions and coma more frequently precede death, and death occurs at an earlier period than in the other form of pneumonia.

Such is a sketch, confessedly a most imperfect one, of pneumonia in childhood. It may be well to attempt, by more minute details on some points, to fill up the numerous deficiencies in the portraiture. Sydenham indeed was able, within less space than this rude outline has already occupied, to draw pictures of diseases, so graphic and so true that all the observations of after years have found in them little to add, nothing to expunge. They however, who can never hope to emulate so great a master, must content themselves with literally following his instructions, that "morborum phænomena clara ac naturalia, quantumvis minuta, per se accuratissime adnotentur; exquisitam pictorum industriam imitando, qui vel nævos et lævissimas maculas in imagine exprimunt."

The modifications in the character of the respiration in pneumonia, and the physical signs of the disease are of such importance as to merit most careful examination. Some acceleration of the respiration is almost always observed in cases of idiopathic pneumonia, but its degree affords no certain measure of the extent of the disease, nor will it be altogether safe to infer the absence of pneumonia from the non-existence of dyspnea. It is my belief, however, that marked dyspnea will be found in all cases of lobular pneumonia, and also in all those cases of lobar pneumonia which have been preceded by catarrhal symptoms, or are associated with them. It is often absent, or so slight as to be readily overlooked in the pneumonia which complicates diarrhea, remittent fever, and other abdominal

affections: as also in some cases where the thoracic symptoms are masked by the signs of cerebral or abdominal disease, constituting the *pneumonia larvata* of the old writers, in which but for the aid afforded by auscultation, the true nature of the ailment would probably not be discovered. The frequency of the respiration does not in general continue progressively increasing from the outset of the disease to its fatal termination, but its maximum frequency usually coincides with that stage of the disease at which the crepitant or sub-crepitant rhonchus has attained its greatest extent, and sinks again when bronchial respiration and dullness on percussion indicate that the lung has become solid. When the attack of pneumonia is sudden and violent, and unpreceded by premonitory symptoms, the respiration sometimes reaches its greatest frequency within the first twenty-four hours; at a time when the auscultatory signs are scarcely developed, and when the ear detects nothing but intensely puerile respiration with occasional rhonchus or sibilus. In lobular pneumonia, which sometimes runs its course in four or five days, death taking place before any portion of the lung has become hepatized, the respiration may go on increasing in frequency until death. It is in such cases that I have observed the respiration more accelerated than under any other circumstances, and in one child so affected I counted 108 inspirations in the minute. Although the respiration often sinks in frequency on the supervention of hepatization it does not by any means return to a natural condition, but almost always becomes irregular. One or two slow inspirations are now succeeded by three or four very hurried, and it will be observed that now, while the help of the abdominal muscles is called largely into play, the lateral expansion of the chest is almost none. The marked influence too, of removing the child from the recumbent posture, and placing it in a sitting position, in causing great acceleration of the breathing, at once shows that the diminished frequency of the respiration is not the result of any favorable change. It appears then that unquestionably valuable as are the indications furnished by the frequency of the respiration, there are many other points beside the mere number of inspirations which merit to be taken into account. Of greater value than the frequency of the respiration considered alone, is its frequency as compared with that of the pulse. Whenever with a diminution in the frequency of the respiration, the number of the pulse sinks too, we have a sign of amendment on which the most thorough reliance may be placed. It is of importance, however, always to bear in mind, how easily both the pulse and respiration are accelerated in young children; they ought both therefore to be counted while the child is in the recumbent posture, and before it has been disturbed or alarmed by auscultation, or by the examination of any other symptoms. It is better, too, if on any occasion this order of investigation cannot be followed, or if the child is fretful and cries at any attempt to ascertain these points, not to persevere lest we be led by so doing to form some erroneous conclusions as to the condition of the patient.

PHYSICAL SIGNS. The physical signs of pneumonia are no less important in the child than in the adult, but the practice of auscultation in the former is attended with difficulties which do not occur in the latter. To some indeed, these difficulties have appeared so great as to induce them to regard the application of auscultation to young children as impracticable, while others insist on the insufficiency of the physical signs to establish an accurate diagnosis between bronchitis and pneumonia, and allude to cases in which "though unquestionable results of pneumonia were found after death, there was no crepitant râle and no bronchial respiration."* The valuable monograph of MM. Rilliet and Barthez, however, has sufficiently proved the possibility of deriving most important information from auscultation, and it is my conviction that with a little tact and a good deal of patience, pneumonia may be detected by its physical signs in the child, almost as surely as in the adult. It is true that infants will not tolerate the application of the stethoscope, and that they will seldom allow any examination of the front of their chest; but the whole posterior part of the thorax may almost always be ex-

* Maunsell and Evanson, op. cit. p. 306.

amined, and such an examination yields results which are of the greatest value. In practising auscultation I have usually found it best to have the child taken from its cot and placed in a half-sitting posture in its nurse's arms. It is now possible, kneeling by the nurse's side, to listen to the whole posterior part of the chest unperceived by the infant, who does not appear to be incommoded by the pressure of the head against its back in the same manner as it is by the application of the stethoscope. Percussion too, may in this way be made upon the finger of the other hand so as to afford very useful information. Even in cases where children are most fretful and alarmed and resist every attempt at auscultation, something may still be learned; for during the deep inspirations which interrupt their violent cries, air will enter freely, and from the sounds then heard by the attentive ear it will be easy to estimate the extent and stage of the disease.

It has seldom happened to me to see cases of infantile pneumonia from their commencement. In a few instances, however, when the onset of the disease has been sudden and violent, children have been brought to me within a few hours after the beginning of the attack. In these cases I have been able to confirm the observation of Dr. Stokes, that an intense puerility of respiration in the affected part will be found to be the principal phenomenon. On visiting these patients on the following day after their general symptoms have been greatly ameliorated by depletion and the employment of other remedies, I have no longer heard this intensely puerile respiration, but in its place the mucous or sub-crepitant rhonchus.

Cases such as those above described form the exception to the rule, and usually children did not come under my notice until the sounds indicative of increased secretion were audible in the lungs. These are either the mucous or subcrepitant rhonchus or the true pneumonic small crepitation.

Mucous rhonchus. The mucous rhonchus is heard in most cases where catarrh has preceded the symptoms of pneumonia: it is, moreover, often heard in other cases of lobar pneumonia in the neighbourhood of the sub-crepitant rhonchus which usually occupies the lower and posterior part of the lungs. It is further heard occasionally in situations where the respiration has a distinctly bronchial character, and it very often persists in cases where convalescence has taken place, long after the disappearance of every other sign of pulmonary affection. It would be too much to assert that a portion of lung in which mucous rhonchus is heard may become solid without giving rise previously to any other physical sign, but it is certain, from the statements of MM. Rilliet and Barthez, that this change does sometimes occur so rapidly that bronchial respiration shall be heard to-day in a portion of lung, where on the day previous mucous rhonchus was the only sound the ear could detect. Of the accuracy of this statement I entertain no doubt, though I can confirm it from personal observation, only in as far as regards the *extension* of bronchial respiration not with reference to its *actual origin* in a lung. Often, however, I have detected bronchial respiration on one day occupying a very small portion only of one lung, while mucous rhonchus was heard in its neighbourhood, and on the following day much of this rhonchus has vanished and bronchial respiration has become well marked through twice or thrice its former extent. The occasional coexistence of mucous rhonchus with bronchial respiration is doubtless owing to the accumulation of secretions in the larger bronchi; hence when heard under these circumstances it is an accidental phenomenon and one of no value. The mucous rhonchus must be looked on as one of the least important of the physical signs of pneumonia, since it was present in thirteen only of fifty-one children under five years of age, in whom I carefully noted the symptoms furnished by auscultation. Nevertheless, greater value must, as MM. Rilliet and Barthez observe, be attached to it in the child than in the adult, since it is in the former, at least occasionally, the immediate precursor of bronchial respiration, while in the adult it is never the herald of any such grave occurrence.

Sub-crepitant rhonchus. The sub-crepitant is a sign of far greater importance than the mucous rhonchus, whether we regard the frequency of its occurrence or the consequences which follow it. It was heard in forty-two out of fifty-one cases;

in thirty-one of which it either had not been preceded by mucous rhonchus, or if it had that had ceased before the patients came under my notice.   In thirteen cases it was associated with true crepitant rhonchus in some other part of the lung, or crepitant rhonchus succeeded it.   In fourteen cases it was followed by bronchial respiration, and in six of these the bronchial respiration succeeded directly to it, without crepitant rhonchus having at any time been audible in those parts of the lung which became hepatized.   Unlike the mucous rhonchus, it is not a transitory phenomenon continuing only for a few days, but it is a sign which, after the disease has once become established, persists until either the occurrence of mucous rhonchus in its place indicates that the lung is recovering, or the supervention of crepitant rhonchus or of bronchial respiration makes it evident that the morbid process is advancing unchecked.

Crepitant rhonchus.   In twenty-two cases true crepitant rhonchus was heard, such as distinguishes the pneumonia of the adult.   In fourteen cases it had been preceded by sub-crepitant rhonchus or was associated with it.   In these instances it occupied a smaller extent of lung than the sub-crepitant rhonchus, and sometimes was confined to one lung while the sub-crepitant rhonchus only was heard in the other.   Twice it succeeded directly to mucous rhonchus, and in six cases it was heard unattended either with mucous or sub-crepitant rhonchus.   In fourteen instances it was the immediate precursor of bronchial respiration, and was heard in parts of the lung near that in which the bronchial respiration was audible. The sub-crepitant rhonchus is sometimes a sign of the resolution of pneumonia, not so the crepitant, which I heard only when the disease was advancing, never at its decline, and its duration is far shorter than that of the sub-crepitant rhonchus, seldom exceeding two or three days.

It seems to be agreed on all hands that true pneumonic crepitation is of much less frequent occurrence in children under five years of age, than in the adult. Some writers indeed have gone so far as to deny its existence at this period of life, an opinion which MM. Rilliet and Barthez have shown to be erroneous.   It does not, however, admit of doubt that the true crepitant rhonchus is decidedly less common in the child than in the adult, though it may not be easy to assign a satisfactory cause for this difference.   Some value must probably be attached to the circumstance that while the frequency of the respiration in children is usually considerably increased under the influence of pneumonia, they no longer inspire so deeply as to fill the smaller air-vesicles, but the power of the respiratory muscles seems to be diminished, and the respiratory movements appear to be increased in frequency in order to compensate for their diminished energy.   That some influence must be attributed to this cause is rendered further probable by the fact, that in the pneumonia of old persons, according to MM. Hourmann and Dechambre,[*] a similar absence of crepitant rhonchus is frequent.   Another proof of this is afforded by the fact that in infantile pneumonia sub-crepitant rhonchus will frequently be the only sign perceptible until the child begins to cry, when in the deep inspiration which follows a fit of crying, the air that previously permeated only the larger air-tubes now enters the pulmonary vesicles, and at that moment distinct small pneumonic crepitation will be heard.

Bronchial respiration.   Bronchial respiration was heard in 20 cases, in 5 of which it was detected in both lungs, in 7 it was heard only in the left lung, in 8 only in the right.   It always existed in the infra-scapular region, though it was not by any means invariably confined to that situation.   It sometimes supervened with great rapidity, occupying the whole of the lower half of one lung within twenty-four hours, and occasionally disappearing, as has been observed by Dr. Stokes in the pneumonia of adults with similar rapidity, leaving no trace of its existence but large sub-crepitant rhonchus amounting almost to mucous rhonchus.   Usually, however, it came on more gradually, occupying situations where crepitant or sub-crepitant rhonchus had been previously heard, and continued to be audible in cases which eventually terminated favorably for a week or even longer.   Some-

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[*] Archives Générales de Médecine, 2e série, tome xii. p. 45.

times the bronchial respiration was unaccompanied by any other auscultatory sign
in the same lung, but in the majority of cases sub-crepitant rhonchus was heard in
its neighbourhood, and not unfrequently mucous rhonchus in its very situation.
When resolution of the hepatized lung took place, I never heard a return of cre-
pitant rhonchus, but sub crepitant rhonchus in most cases became audible; in a
few instances mucous rhonchus. In either case mucous rhonchus was eventually
heard, and it often continued for many days after the lung had in other respects re-
covered its natural condition; apparently much as in the pneumonia of the adult, a
prolonged expiration often persists for a long time after all the other signs of dis-
eased action have disappeared.   Bronchial respiration must be regarded as a
very grave sign, since in 11 out of 20 cases in which it was heard, the disease had
a fatal termination.

Results of percussion. Though the results of percussion are decidedly less valu-
able than those of auscultation, yet this mode of investigation is by no means to be
passed over as valueless.   It is true that the great natural resonance of the chest
in the young subject, the circumstance that both lungs are usually affected, and
the restless fretfulness of the patient render it less trustworthy than in the adult.
Still a difference between the upper and lower part of the chest is generally ap-
preciable long before bronchial respiration becomes audible; when bronchial re-
spiration exists, dulness on percussion can always be detected, and even if it
should be necessary to percuss with the utmost gentleness, so as scarcely to elicit
a distinct sound, the finger is yet sensible of the presence of solid lung beneath.
In cases, however, where the child cries even at the gentlest percussion, I think it
better to give up the attempt, rather than by persevering in it to make the little
patient dread the presence of his medical attendant, an occurrence which it is of
extreme importance to avoid.

DISEASES WITH WHICH PNEUMONIA MAY BE CONFOUNDED.   Before altogether
dismissing the consideration of the symptoms of pneumonia, some notice must be
taken of those errors of diagnosis into which the practitioner is most likely to fall.
There are two stages of pneumonia, at each of which there is considerable danger
of mistaking it for some other disease, namely, just at its commencement, and after
it has existed for some considerable time.

Hydrocephalus.   Pneumonia in its early stage may be mistaken for incipient
hydrocephalus.   The vomiting, pain in the head, restless nights with occasional
wandering in the sleep, and the constipated state of the bowels common to both
diseases, lead to this error.   The cough in some cases of pneumonia is so slight as
scarcely to be noticed; perhaps no catarrhal symptoms ushered in the disease, and
not unfrequently the child's complaints are of his head, and of nothing else.   But
still there are circumstances, which, wholly independent of auscultation, would lead
the careful observer to discriminate accurately between hydrocephalus, or cerebral
congestion, and pneumonia. The vomiting in hydrocephalus is extremely frequent in
its recurrence, the stomach immediately rejecting even the blandest fluid, and the
matters vomited often have a greenish tinge, and this irritability of the stomach some-
times continues for days.   The sickness in pneumonia resembles that which some-
times ushers in an attack of fever; it is violent, but does not in general continue long.
The bowels are constipated in both diseases, but the evacuations of a hydrocephalic
patient are either white from the complete absence of bile, or more frequently of
a dark mud colour.   The tongue in hydrocephalus is usually less furred, it is
always of a less vivid red, the pulse though frequent has not the character of full-
ness, the heat of skin is far less, the thirst is absent. If these indications, however,
be overlooked at the commencement of the attack, and if auscultation, by which
the error might still be set right, be neglected, it is probable that each subsequent
occurrence will be misinterpreted, and that the real nature of the disease will not
be understood until it is revealed by the post-mortem examination.   More or less
sympathetic affection of the head is seldom wanting in pneumonia, to confirm the
preconceived, erroneous, notion; while as the child grows worse the difficulties in
the way of making a careful auscultation increase.   Convulsions too sometimes

come on, and for days before the fatal termination the cerebral symptoms may be far more prominent than those indicative of affection of the lungs.

Peritonitis. Pneumonia may likewise be confounded with peritonitis or enteritis. The general febrile symptoms are common to both diseases, the little patient complains of pain in the belly, and cries, or shows signs of uneasiness if pressure is made on the abdomen. The tongue is red, and in young children it often becomes dry from their lying with their mouth open; and poultices and leeches give at least temporary relief. It should, however, be borne in mind that while pneumonia is a very common disease in childhood, acute peritonitis is one of very unusual occurrence. The child too does not select his posture with that great attention to guarding the abdomen, which he would display, if labouring under peritonitis. With reference to the complaint of pain in the abdomen and its intolerance of pressure; it is of importance to remember that the statements of children with reference to the seat of pain are very vague, and that they frequently speak of pain in the belly when they mean the chest; while the impediment to the descent of the diaphragm occasioned by pressure on the abdomen, especially if this pressure is either sudden or considerable, will almost always excite expressions of uneasiness when the organs of respiration are in any way affected.

Dentition. Perhaps pneumonia is never so frequently overlooked as when it comes on in children during teething. It often happens among the poor that these cases are not brought to the medical practitioner until after the inflammation of the lungs has been proceeding for some days unchecked. Its early symptoms have probably been regarded merely as the catarrh which is incidental to children when cutting their teeth; and thus the parents, and sometimes too the medical attendant, allow the time for action to pass by unused. The disease in this case sometimes runs a chronic course, and its nature is further obscured by the tendency to diarrhea, which exists during dentition, and which is now excited by the thoracic affection. This often becomes the most striking symptom, and all means are employed to suppress it, and to check the vomiting which generally attends it. These efforts however are unavailing, the child wastes daily, and its skin hangs in wrinkles about its attenuated limbs, while the abdomen becomes tumid, from the collection of flatus in the large intestines, and tender on pressure, and the tongue grows red, dry and chapped, or covered with aphthous ulcers. The cough now perhaps attracts notice, but its occurrence serves only to console the doctor with the belief that these symptoms have depended on phthisis, and that he has failed to afford relief because the disease was in itself irremediable. At last the child is worn out and dies, and great is the surprise to find no tubercle in any part of the body, no disease in the intestines; but pneumonia with purulent infiltration in both lungs; a disease which ought to have been detected, and which probably might have been cured.

TREATMENT. I will now endeavour to sum up as briefly as possible what I think I have learned of the treatment of this disease by careful and unprejudiced observation. I do so, however, with great diffidence, for I feel that none but they who have grown gray in the practice of their profession, and who can preface their remarks by appealing to "lengthened meditation, and to the diligent and faithful observation of many years," are in a position to claim for their opinions on such a subject any consideration. I can only plead my excuse, in the words of Sydenham; if indeed there be not something of presumption in borrowing the expressions of that great man: "Cæterùm quantacunque fuerint aliorum conamina, semper existimavi mihi vitalis auræ usum frustra datum fore, nisi et ipse in hoc stadio versatus, symbolum aliquod, utcunque exiguum, in commune Medicinæ ærarium contribuerem."

Depletion. The first rank as a curative agent in the treatment of idiopathic pneumonia, I would unhesitatingly assign to depletion. It is true indeed that on this, as on some other points, my experience differs from that of French writers who have studied the disease at the children's hospital at Paris. One of these gentlemen[*] has affirmed that depletion, whether general or local, invariably de-

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[*] M. Becquerel, in the Archives Générales de Médecine, 1839, p. 471.

bilitates the organism, and accelerates the fatal event. True as this assertion may be of pneumonia occurring under the peculiar circumstances which that institution presents, it cannot be extended to it as it is seen in this country. In no case of idiopathic pneumonia which came at an early stage under my notice, have I had occasion to regret the employment of depletion carried so far as sensibly to affect the system. In children of two years old and upwards I have usually resorted to venesection; but in younger subjects have contented myself with the application of leeches. From a child of two years old I have been accustomed to take ʒiv. of blood, and to direct the application of four or six leeches beneath the scapulæ if the symptoms should appear unrelieved after the lapse of a few hours. The effects produced by one bleeding in some of these cases have been most striking; the violent symptoms have sometimes yielded at once, and recovery has gone on uninterruptedly almost without the employment of any other remedy. Of the frequent repetition of bleeding in *these cases*, whether from the arm or by leeches, I have no experience, but my conviction is that children *generally* bear repeated bleedings ill, and I therefore do not practise them. That form of pneumonia which develops itself out of catarrh appears to be least under the control of depletion; no instance having come under my notice in which the attack was cut short by its employment, though here too, local bleeding at the outset is often beneficial.

Tartar-emetic. The tartar-emetic is a remedy of great value in the treatment of pneumonia; but I can by no means subscribe to the unqualified recommendation of it by some French physicians in all forms and at all stages of the disease. I would rather say of it what Wolfgang Wedel says of opium, " Sacra vitæ anchora, circumspecte agentibus, Cymba Charontis in manu imperiti." The cases in which it has seemed to me to be of the greatest service were those in which the pneumonia developed itself out of previous catarrhal symptoms, or in which it supervened on measles, or came on in the course of hooping-cough. In such cases, antimony given in doses of a quarter of a grain to a child of two years old, repeated every ten minutes, till free vomiting is produced, and afterwards continued every two or three hours for forty-eight or sixty hours, has often appeared to be of the most essential service, and the preservation of the patient's life has seemed in several instances to be due to its employment. In pneumonia, too, which has not been preceded by catarrhal symptoms; if after venesection the respiration still continues as hurried as before, and the condition of the patient has been apparently but little improved by that measure, tartar-emetic has seemed to be extremely useful. I have been accustomed to give it in large doses, as a quarter of a grain for a child two years old, and to repeat it every two hours for twenty-four hours, and have observed its use to be followed by a great diminution in the frequency of the respiration, and considerable relief to the distress of the patient; and believe that when given in these cases it paves the way for the advantageous employment of mercury. In no instance, however, in which pneumonia had been neglected, so that the period for depletion was past, and in which distinct bronchial respiration was audible, have I seen beneficial results from the employment of antimony in large doses, as recommended by many French practitioners. It is true that the heat of skin will subside and the respiration will diminish in frequency; thus inducing a treacherous appearance of improvement; but the strength of the patient is seriously impaired by it, the occurrence of a comatose condition, or of what the Germans have called the paralytic stage, will be hastened, and the fatal event accelerated, as I have learned by sad experience in cases where I gave this mode of treatment a full trial. It is not meant, however, that after the supervention of bronchial respiration, antimony ought never to be given, but only that under such circumstances it has appeared to me that it should not be employed except in small doses and in combination with other remedies.

Calomel. A very high rank as a remedial agent in the treatment of idiopathic pneumonia must be given to calomel. I have been accustomed, after due depletion, to administer calomel in doses of two grains, combined with a quarter of

a grain of tartar emetic, and half a grain of Dover's powder, and to repeat it every four hours for children of four years of age; diminishing the antimony after the lapse of twenty-four hours, if distressing sickness were occasioned by it, but persevering in the use of the calomel, provided the patient were not over-purged, until the disease began to yield or the gums showed signs of the mercurial action. The latter occurrence has been by no means frequent, and in no instance have I met with dangerous mercurial affection of the mouth from the employment of calomel in these cases. It has always been my custom to suspend the use of calomel for twelve hours immediately on the first appearance of mercurial affection, and if after the lapse of that time the signs of mercurialization had not increased, to return to its use in smaller doses, and repeated at longer intervals, provided the symptoms of pneumonia were so urgent as to demand its continuance. I have oftener been harassed by the purging which calomel induces, though this may be in a great degree controlled by combining it with Dover's powder. Besides the inconvenience and danger attending over-purging, calomel has seemed in some instances, especially in infants, to occasion a very harassing nausea and vomiting, which have rendered its discontinuance necessary, lest the patients should suffer from the want of sufficient nutriment. In such cases I have had recourse to mercurial inunction, and under its employment recovery has taken place even where circumstances had seemed to warrant none but a most unfavorable prognosis. It is especially in cases of neglected pneumonia, where the time for depletion has long gone by, where the administration of antimony is evidently contra-indicated by the exhausted state of the patient, and where the existence of diarrhea forbids the employment of calomel, that the full value of this remedial agent is seen. I have employed it in the proportion of ʒj, rubbed into the thighs or axillæ every four hours, in children of four years of age. I have never observed salivation induced by it, but have seen the symptoms gradually diminish in severity during its employment, and the solid lung become once more permeable to air.

Stimulants. Usually, when the employment of mercurial inunction is indicated, the time for all directly-depressing measures has long passed, and the best means of supporting the patient's strength become matter for serious consideration. No point in the treatment of the disease is more difficult than that of seizing the exact moment when the employment of stimulants becomes necessary, and no general rule for regulating their use can be laid down. It has, however, appeared to me to be seldom safe to withhold them when extensive bronchial respiration exists in a case on its first coming under the care of the practitioner, or when it has supervened in spite of active antiphlogistic treatment. If the patient, too, is beginning to be much purged; if the respiration is becoming more laboured and irregular, though diminished in frequency; and if the pulse is becoming more frequent and above all smaller and smaller, it is high time to resort to their use. Wine is as indispensable in such cases in the pneumonia of children as in that of the adult, and it may be necessary to give it even to infants at the breast. Ammonia may also be advantageously administered in this stage of the disease, either in a mixture with the decoction of senega, or dissolved in milk which conceals its disagreeable pungency better than any other vehicle. If diarrhea does not exist, strong beef-tea or veal-broth is the best form in which nutriment can be given; but if the bowels are relaxed, arrow-root, or the *decoction blanche** of the French hospitals should be substituted for it.

Blisters. Blisters would probably be employed about this time in the treatment of pneumonia in the adult, but I cannot recommend their application in children. One objection to them arises from the time which elapses before they rise sufficiently, during the greater part of which they inflict considerable pain on the little patient, and make him extremely restless. The sores they produce when they cause vesication are sometimes very dangerous; they may even

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* This, which is similar to the white decoction of Sydenham, is prepared by boiling half an ounce of hartshorn shavings, and the inside of a roll, in three pints of water, till reduced to a quart.

become gangrenous, and occasion the patient's death. Even if no such unfavorable results follow, they are nevertheless a source of constant annoyance to the child, at first from their soreness, afterwards from the troublesome itching which is felt when they begin to get well. Some pain is unavoidably produced whenever the dressings are changed, and the frequent repetition of this painful process some-times makes the child take a dislike to its attendants, who seem to it to be the causes of so much suffering. It becomes suspicious of every one and quite un-manageable, while nothing is of greater moment than that a sick child should re-tain its fondness for its attendants during the whole period of its illness.

Mustard-poultices. It is quite possible that some of these objections may be obviated among the children of the wealthy by that care and those comforts which riches can always command, but I have been led, by the reasons above stated, to discontinue the employment of blisters in the treatment of pneumonia among the children of the poor. The same objections do not apply to the employ-ment of mustard-poultices, and in many instances they have seemed to be produc-tive of great good. They produce a much more speedy effect than blisters, and may be applied with safety over a much larger surface, hence they are often of signal benefit in relieving sudden accessions of dyspnea; while from their not occa-sioning any breach of surface they may be reapplied as often as the emergencies of any case require.

Of the subsidiary medicinal agents, such as ipecacuanha and the class of expec-torants, nothing need be said; but there are one or two points in the general management of the disease not altogether unworthy of notice.

General management. It is desirable, in all cases of pneumonia at all severe, that infants should be taken from the breast, and that the mother's milk should for a time be given them from a spoon. This is of importance on two accounts; partly because the thirst they experience induces them to suck overmuch, (hence it is well that barley-water or some other diluent be given to them frequently in-stead of the milk, in order that they may quench their thirst without overloading their stomach;) partly, because the act of sucking is in itself mischievous, since, as must at once be perceived, it taxes the respiratory functions to the utmost.

A second important point is never to allow the children to lie flat in bed or in the nurse's arms, but to place them in a semi-recumbent posture in the arms, or propped up in bed. By so doing respiration is facilitated, since the diaphragm is relieved from the pressure of the abdominal viscera, and that stasis of the fluids in the posterior parts of the lungs is prevented, which has been shown by French writers to be so prejudicial to infants or children labouring under pneumonia.

The only other point to which I will allude is, that when pneumonia has reached an advanced stage, or has involved a considerable extent of the lungs, the children should be moved only with the greatest care and gentleness, lest convulsions should be brought on. Whatever may be the explanation of this occurrence, the danger is by no means an imaginary one, for I have seen instances in which children have been seized with convulsions immediately on being lifted somewhat hastily from bed and placed in a sitting posture; and on this account I have re-ferred to what might seem to be a trivial matter.

PART FOURTH.
𝔐𝔢𝔡𝔦𝔠𝔞𝔩 𝔍𝔫𝔱𝔢𝔩𝔩𝔦𝔤𝔢𝔫𝔠𝔢.

THE SYDENHAM SOCIETY.

[THE following prospectus, which we transcribe at length, gives so clear an account of the nature and objects of the new Society, that we have scarcely anything to add to commend it to the notice of our readers. None but those who, like the editors of critical Journals, are called on to examine all publications that issue from the medical Press, can be fully aware of the extent to which ignorance of the medical literature of past times—even of that immediately preceding our own time—prevails among the members of our profession. It is lamentable to think to what an extent the weekly journals constitute the habitual reading of a large portion of medical men, than which nothing can be imagined less likely to advance sound knowledge, or improve good taste. We have some hope that the Works to be issued from the Sydenham Press, and which must, in some degree, compel the attention of the profession to them, may awaken a relish for a higher and healthier literature.]

Prospectus.—The Sydenham Society has been founded for the purpose of meeting certain acknowledged deficiencies in the diffusion of medical literature, which are not likely to be supplied by the efforts of individuals. It will carry this object into effect by distributing among its members—

1. Reprints of standard English medical works, which are rare and expensive.

2. Miscellaneous Selections from the ancient and from the earlier modern authors, reprinted or translated.

3. Digests of the most important matters contained in old and voluminous authors, British and foreign, with occasional biographical and bibliographical notices.

4. Translations of the Greek and Latin medical authors, and of works in the Arabic and other Eastern languages, accompanied, when it is thought desirable, by the original text.

5. Translations of recent foreign works of merit.

6. Original works of great merit, which might be very valuable as books of reference, but which would not otherwise be published, from not being likely to have a remunerating sale,—such as classified Bibliographies, and alphabetical Indexes to periodical publications and other valuable voluminous works.

The Society will consist of an unlimited number of members.

The subscription constituting a member is one Guinea annually, for which he will be entitled to a copy of every work printed by the Society, during the time of his subscription.

The subscriptions are to be paid in advance ; and no member is responsible beyond the amount of his subscription.

All works published by the Society will be selected by the Council ; and, previous to publication, will be subjected to their supervision.

The Society will not commence its operations until the number of its members amounts to five hundred.

The works of the Society will be printed for members only ; on a uniform plan, and with a good legible type.

The Society will be under the direction of a Council of twenty-four members, elected at the annual general meeting from the subscribers at large ; and of this number eighteen only will be re-eligible for the following year.

The President and Vice-Presidents will also be elected annually.

As the expense of management will be very small, nearly the whole of the funds subscribed will be devoted to the publications; and as the proportionate cost of producing books decreases as the number of copies increases, it is anticipated

that, when the Society is fully organized, the annual supply of works to members will be considerable.

The great success that has attended other Societies, established on similar principles, and with like objects,—as the CAMDEN, the PARKER, the PERCY, &c.,* leaves no room for doubt as to the eventual prosperity of the Sydenham Society. It would indeed be strange, if Medicine, which boasts of a literature more extensive than that of any other art or science, and of cultivators as numerous, zealous, and learned, as any other department of human knowledge, should fail in attaining an end which has been so speedily and so fully accomplished by the societies referred to, and by others embracing even less comprehensive objects.

The Gentlemen named below, as constituting the Provisional Council, have undertaken the organization of the Society, and will continue to act until its constitution and government are finally fixed at a general meeting of the members. They have great satisfaction in being able to lay before their medical brethren the names of the eminent individuals who have consented to act as Provisional President and Vice-Presidents, and who have promised their zealous co-operation in carrying into effect the important objects of the Society.

PROVISIONAL OFFICERS OF THE SYDENHAM SOCIETY.

President.

SIR HENRY HALFORD, Bart. G.C.H. M.D. F.R.S. F.A.S. President of the Royal College of Physicians, Physician to the Queen.

Vice-Presidents.

JOHN ABERCROMBIE, M.D. F.R.S.E. First Physician to the Queen for Scotland.
W. P. ALISON, M.D. F.R.S.E. Professor of Medicine in the University of Edinburgh.
JOHN BLACKALL, M.D. Physician to the Devon and Exeter Hospital.
SIR BENJAMIN C. BRODIE, Bart. F.R.S. Sergeant-Surgeon to the Queen.
SIR WILLIAM BURNETT, M.D. F.R.S. K.C.H. Inspector-General of Fleets and Hospitals.
JOHN BURNS, M.D. F.R.S. Professor of Surgery in the University of Glasgow.
WILLIAM FREDERIC CHAMBERS, M.D. F.R.S. K.C.H. Physician to the Queen and to the Queen Dowager.
SIR JAMES CLARK, Bart. M.D. F.R.S. Physician to the Queen and to the Prince Albert.
SIR PHILIP CRAMPTON, Bart. F.R.S. Surgeon-General to the Forces in Ireland.
R. J. GRAVES, M.D. M.R.I.A. Physician to the Meath Hospital, Dublin.
SIR JAMES M'GRIGOR, Bart. M.D. F.R.S. L. and Ed. Director-General of the Medical Department of the Army.
JOHN HAVILAND, M.D. Regius Professor of Physic in the University of Cambridge.
JOSEPH HODGSON, F.R.S. Surgeon to the General Hospital, Birmingham.
HENRY HOLLAND, M.D. F.R.S. Physician Extraordinary to the Queen, and Physician to H.R.H. Prince Albert.
JOHN KIDD, M.D. F.R.S. Regius Professor of Medicine in the University of Oxford.
BENJAMIN TRAVERS, F.R.S. Surgeon Extraordinary to the Queen, Surgeon in Ordinary to H.R.H. Prince Albert.

Provisional Council.

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W. A. GUY, M.B.	ROBERT WILLIS, M.D.
SAMUEL LANE, Esq.	ERASMUS WILSON, Esq.

Secretary to the Provisional Council.—W. G. BURROUGHS, Esq.

* The present number of subscribers to the Parker Society for publishing theological works, exceeds 7000. The number of members in the Camden is limited to 1200, and that number has long been complete.

ORIGINAL PAPERS IN THE BRITISH MEDICAL JOURNALS.

For the Quarter ending 20th March 1843.

Surgery, including Diseases of the Eye and Ear.

Midwifery, and Diseases of Women and Children.

Medical Jurisprudence, and Hygiene.

Materia Medica, Pharmacy, and Chemistry.

Medical Statistics, and Miscellaneous.

BOOKS RECEIVED FOR REVIEW.

ENGLISH.

1. A Practical Treatise on the Teeth, showing the causes of their destruction, and the means of their preservation, with Plates. Third Edition. By W. Robertson. London, 1842. 8vo, pp. 224.

2. The History, Diagnosis, and Treatment of Typhoid and of Typhus Fever, &c. By Elisha Bartlett, M.D., Professor of Medicine in Transylvania University. Philadelphia, 1842. 8vo, pp. 393.

3. The New England Quarterly Journal of Medicine and Surgery, Editors C. E. Ware, M.D., S. Porkman, M.D. Nos. I and II, July and October, 1842. — Boston. [*These are the first numbers of a new Journal of much promise, patronised by the head of the profession in Boston. Supported by such enlightened men, it cannot fail to prosper.*]

4. Physician for Ships; containing medical advice for seamen, &c. Third Edition. By Usher Parsons, M.D., &c.—Boston, 1842. 8vo, pp. 216.

5. The Physical Diagnosis of Diseases of the Lungs. By W. H. Walshe, M.D., &c.—London, 1843. 8vo, pp. 307.

6. Lectures on Animal Physiology; or the physical condition of man as regards health and disease. By B. T. Lowne, esq. —London, 1842. 8vo, pp. 101.

7. Chemical Manipulation : being instructions to Students in Chemistry, &c. By M. Faraday, D.C.L. F.R.S., &c.—London, 1842. 8vo, pp. 664.

8. Thermal Comfort; or Popular Hints for preservation against Colds, Coughs, and Consumption. By Sir Geo. Lefevre, M.D. &c.—London, 1843. 8vo, pp. 81. 1s.

9. An Exposition of the Pathology and Treatment of Tubercular Phthisis. By S. Flood, M.R.C.S.—London, 1842. small 8vo, pp. 82.

10. The Cyclopædia of Practical Surgery, Part xii. Fracture—Gastro-Hysterotomy. January, 1843. 5s.

11. On a peculiar Development of the Bones of the Forearm. By John Gardner, Surgeon.—London, 1843. 8vo, pp. 8.

12. Experimental and Practical Researches on Inflammation, and on the Origin and Nature of Tubercles of the Lungs. By W. Addison, f.l.s.—London, 1843. 8vo, pp. 76. 5s.

13. Elements of Electro-Metallurgy. By Alfred Smee, f.r.s. &c. Second Edit.—London, 1843. 8vo, pp. 338. 10s. 6d.

14. A System of Clinical Medicine. By R. J. Graves, m.d., m.r.i.a., &c.—Dublin, 1843. 8vo, pp. 937. 18s.

15. Transactions of the Medical and Physical Society of Bombay, for the Year 1841.—Bombay, 1841. 8vo, pp. 156.

16. Outlines of Pathology and Practice of Medicine. By W. P. Alison, m.d., &c. Professor of Medicine in the University of Edinburgh. Parts i. & ii.—Edinb. 1843. 8vo, pp. 499. 12s.

17. Observations on the principal Medical Institutions and Practice of France, Italy, Germany, &c. By Edwin Lee, m.r.c.s. 2d. Edit.—Lond. 1842. 8vo, pp. 269. 7s.6d.

18. Two Lectures on the Defective Arrangements in large Towns to secure the Health and Comfort of the Inhabitants. By H. Sandwith, m.d.—London, 1843. 8vo, pp. 55. 1s.

19. Views upon the Statics of the Human Chest, Animal Heat, and Determination of Blood to the Head. By Julius Jeffreys, f.r.s.—London, 1843. 8vo, pp. 233. 6s.

20. Observations on the Extraction of Teeth. By J. C. Clendon, Surgeon-Dentist. —London, 1843. 12mo, pp. 80. 3s. 6d.

21. Criminal Jurisprudence considered in relation to Organization. By M. B. Sampson. Second Edition, with Additions. —London, 1843. 8vo, pp. 147. 5s.

22. Interment and Disinterment; or a further Exposition of the Practices pursued in the metropolitan places of Sepulture, &c. By G. A. Walker, Surgeon.—London, 1843. 8vo, pp. 28.

23. Pharmacologia; being an extended Inquiry into the Operations of Medicinal Bodies, &c. By J. A. Paris, m.d. f.r.s. &c. 9th Edit.—Lond. 1843. 8vo, pp. 622. 20s.

24. Elements of Materia Medica and Therapeutics. By A. T. Thomson, m.d., f.l.s., &c. Third Edition.—Lond. 1843. 8vo, pp. 1232. 31s. 6d.

25. Treatment of the Diseases of the Eye by means of Prussic Acid Vapour, &c. By A. Turnbull, m.d.—Lond. 1843. 8vo, pp. 89. 2s. 6d.

26. Fourth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England, pending 1842.—Lond. 1842. Fol. 228.

27. A Treatise on Diet, comprising the Natural History, &c. By W. Davidson, m.d. —London, 1843. 8vo, 383. 6s.

28. The Causes, Nature, and Treatment of Acute Hydrocephalus, or Water in the Head. A Prize Essay. By J. R. Bennett, m.d.—London, 1843. 8vo, pp. 248. 8s.

29. Popular Cyclopædia of Natural Science. Part iii, Mechanical Philosophy.—London, 1843. 8vo, pp. 313.

30. The Physiological Anatomy and Physiology of Man. By R. B. Todd, m.d., f.r.s., and W. Bowman, f.r.s. Part i.—London, 1843. 8vo, pp. 200. 7s. 6d.

31. The Hunterian Oration, delivered at the Royal College of Surgeons on the 14th Feb. 1843. By James M. Arnott.—London, 1843. 8vo, pp. 37.

32. A new Theory and Treatment of Disease, founded on Natural Principles. By John Tinnion, m.d., Ayr.—Edin. 1843. 8vo, pp. 35.

33. Derangements, primary and reflex, of the Organs of Digestion; with an Addition. By R. Dick, m.d.—Edin. 1843. 8vo, pp. 389. 7s. 6d.

FOREIGN.

1. Praxeos Medicæ Universæ Præcepta. Auctore Josepho Frank Joannis Petri Filio, &c., &c. Part iii, Vol. ii, Sect. i, continens doctrinam de morbis tubi intestinalis, quam exposuit, F.A. B. Puchelt, m.d. &c. —Lipsiæ, 1842. 8vo, pp. 786.

2. Mémoire sur l'Emploi des Caustiques dans quelques maladies de l'Urètre. Par le Dr. Civiale.—Paris, 1842. 8vo, pp. 59. (not published.)

3. Mémoire sur l'Anatomie pathologique des rétrécissemens de l'Urètre. Par le Dr. Civiale.—Paris, 1842. 8vo, pp. 74, (not published.)

4. Die Krankheiten des höheren Alten und ihre Heilung: dargestellt Von Dr. C. Canstatt. Zwei Bänder.—Erlangen, 1839. 8vo, pp. 268, 421.

5. Die Specille Pathologie und Therapie. Von Dr. C. Canstatt. Erster und Dritter Band.—Erlangen, 1841-2. 8vo, pp. 331, 764.

6. Pharmacopœa Austriaca. Editio quarta, emendation. — Vendibona, 1836. 8vo, pp. 196.

7. Proeve van een wijsgeerig en zielkundig onderzoek omtrent het regt in algemeen en het strafregt in het bijzonder. Door H. J. Schouten, m.d.—Amsterdam, 1841. 8vo, pp. 338.

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